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SELECTED PAPERS.

On the Temperature of the Summers which are adapted to give activity to the infection or seeds of the Yellow Fever, in the city of Philadelphia.

[From the American Daily Advertiser.]

ON the first day of August 1809, there was published in the American Daily Advertiser, and, on the same day or within a few days after, in most of the other daily papers of this city, an account, which I had prepared, of the state of Fahrenheit's thermometer taken in the shade at 3 P. M. during seventeen summers, 1793 to 1809, both inclusive. I shall now republish that account, and subjoin a state of the same instrument from 1810 to 1817, so as to comprehend in all twenty-five summers, 1793 to 1817. The intent of this publication is to exhibit to public view the mean heat at 3 P. M. of each and every of those summer months, and to draw an inference from thence, that the *Yellow Fever*, being a native of hot climates, cannot probably prevail to any alarming extent here in any season, except the mean heat of the thermometer at that hour, during the summer, and especially during the two whole months of June and July, shall be as high as seventy-nine degrees—if cooler, it will not spread, al-

though some passengers and their clothing and bedding may arrive here, bringing the disease or the infection with them; but in hotter seasons it has prevailed and probably will again prevail more or less, and very much in proportion to the heat of the season.

This is not an enquiry prompted by idle curiosity, but an attempt to establish a knowledge very important in its consequences, not only to all our citizens concerned in naval or mercantile business, but to the whole population of this city and liberties; because, if well founded, as I believe it to be, it will serve as a rule to point out to every citizen when there is, or is not, danger to be apprehended; when it may be necessary, or not, to provide retreats in the country. If well understood and established to be a truth founded in experience, it may also tend to disembarrass the trade of this port, in some years, from detentions and quarantines when they are useless.

By the following account of the mean heat at 3 P. M. of each month in the last twenty-five summers, it will appear evidently that the *Yellow Fever* has never within that period prevailed here at all, or so as to occasion alarm, when the mean heat at that hour of all June and July had been lower than 79°, only a very little in 1802; and that in every summer when it has been above 79° it has prevailed more or less, and the mortality has been regulated very much by the heat being higher or lower. In 1793 and 1798, which were the hottest summers in all the twenty-five years, it prevailed most, and was attended by the most extreme mortality. In 1797, 1799, 1803 and 1805, when lower degrees of heat prevailed, the mortality was less. In all the other years (except a small mortality in 1802) when the mean heat of those two months was below 79° at the hour mentioned, we have had no alarm of *Yellow Fever*.

I consider the two months of June and July as governing the summer season, insomuch that by the first day of August in any year, we may be pretty certain whether we shall be afflicted with *Yellow Fever* that year, or not; so that if we find the mean heat of the thermometer at 3 P. M. placed properly in the shade, in a free current of air, at least 20 or 30 feet from any sunshine, and not exposed to the reflected heat of

any building, to be below 79°, we may rest easy, and conclude that we are not likely to be visited with that scourge during the summer or autumn then passing over our heads.

In 1793 the mean heat of June and July at 3 P. M. was 82°—in 1798 it was 80° 6, both of which indicated the calamity that followed; but August 1798 was so extremely hot, that it heightened the mortality and made it nearly equal to what it was in 1793, when the two first summer months were hotter, but August not so hot as in 1798. The wetness or dryness of the summer may also have an effect, not yet well ascertained; it being remarkable that in 1805 when the mean heat of all June and July was 79° and Aug. 81° 7, the two months of July and Aug. were so very dry, that perhaps not so much as one quarter of an inch in depth of rain fell till within 3 or 4 days of the end of the latter month, when it rained moderately; this rain appeared to be sufficient, coming after the preceding heat, to give activity to the dormant infection of the *Yellow Fever*, which immediately afterwards broke out, more especially in Southwark, where it was very mortal in all September. The use of the Schuylkill water, which is said to be much purer than the old pump water, may have had a beneficial effect by way of prevention within the last ten or twelve years; so may the regulations and care of the different boards of health, which to a certain degree should never be intermitted: still I am of opinion that the heat, not of a few days or weeks, but the mean heat of the summer season, is the grand governing cause, under Providence, that excites or depresses this alarming and dreadful scourge when it appears in our city.

Here follows the state of the Thermometer in each month of those twenty-five Summers as above referred to.

YEAR.	Mean Heat of June at 3 P. M.	Mean Heat of July at 3 P. M.	Average of the two months of June & July at 3 P. M.	Mean Heat of August at 3 P. M.	Mean Heat of the whole three Summer months at 3 P. M.	REMARKS.
**1793	79 7	84 3	82	82 7	82 2	Note.—The *Yellow Fever* years are marked with an Asterism.
1794	75 6	80 4	78	81 7	79 2	Great mortality of yellow fever in Philadelphia—4000 died in August, September and October.
1795	75	82 2	78 6	80 3	79 2	No alarm of yellow fever here.
1796	76 5	81 5	79	80 3	79 4	Ditto—fever in New York and Norfolk.
*1797	79	84 2	81 6	79	80 7	No alarm here.
**1798	77	82	79 5	86 5	81 8	Yellow Fever here—1250 died in three months.
*1799	77	84	80 5	82	81	Great yellow fever here—3500 died in 3 months.
1800	75	78	76 5	78	77	Yellow fever here—1000 died in three months.
1801	76	80	78	77	77 7	No alarm here—fever in Baltimore.
*1802	75 7	78	76 3	78	77 2	No alarm here.
*1803	76 9	81 8	79 3	79 4	79 3	Yellow fever spread a little—perhaps 200 adults died of it.
1804	71	78	74 5	75	74 7	Yellow fever here—slightly.
*1805	75	83	79	81	79 7	No alarm here.
1806	78 1	78 7	78 4	72 1	76 3	Yellow fever began about the 1st of Sept. was very mortal in Southwark and little out of it.
1807	71 6	77 9	74 7	75 2	74 9	
1808	75 5	78 8	77 1	76 5	76 9	
1809	73 7	75 1	74 4	76 7	75 1	
1810	74 2	75 4	74 8	75 4	75	
1811	74 4	80 1	77 2	75 3	76 6	All these twelve years were cooler than 79°, on a mean of all June and July at 3 P. M. and there was no alarm of yellow fever in Philadelphia, in any one of them, I believe, or none that spread and continued.
1812	73 8	77 4	75 6	74 2	75 1	
1813	75 3	76 7	76	77 3	76 4	
1814	70 1	73 2	72 6	76 7	74	
1815	74 2	81 8	78	77 3	77 7	
1816	72 5	73 5	73	76 5	74 1	
1817	73 2	78	75 6	77 3	76 3	

The state of the thermometer as above noted has been taken, 1793 to 1799, from the observations of David Rittenhouse, Esq. deceased, or some of his family, made at his place of residence, corner of Delaware Seventh and Mulberry streets, for the next fifteen years chiefly by Dr. Saml. Duffield, deceased, in Chesnut near Front street, in a northern exposure, and since by myself in Delaware Eighth street, with an easterly exposure—All I believe tolerably correct.—Any man may keep such an account for himself, and a thermometer of the price of five or six dollars will answer the same purpose as a more expensive instrument.

Sept. 9, 1817. C. E.

Vauquelin's Analysis of the Ergot of Rye.

[From the London Medical Repository, for April 1817.]

THE *Ergot* having lately attracted much attention, *M. Vauquelin* was induced to undertake its analysis, and has published the result of his experiments*. As this is a subject of considerable interest, we present our readers with a translation of M. Vauquelin's Paper, which is entitled, *Analyse du Seigle Ergoté du bois de Boulogne, pres Paris.*

"M. Desfontaines, who was charged by the Academy of Sciences with the examination of a Notice by M. Virey, relative to the ergot of rye, having engaged me to submit the ergot to chemical analysis, I embraced this task with more willingness, as the object is of the utmost importance, as far as the health both of men and of the lower animals is concerned. Many distinguished chemists, particularly M. M. Bucquet and Cornet, (see *Treatise on the Diseases of Grain*, by M. Tessier,) have analysed the ergot of rye, and I acknowledge that they have nearly exhausted the subject; but as the same causes do not always operate in the production of ergot, I consider it a duty to publish what I have done, with the hope of awakening the attention of Naturalists and Chemists.

"*Physical properties of the Ergot.*—The *colour* is externally violet, and internally white. Its *figure* is cylindrical, the extremities being more or less tapering, and curved in form of a crescent, having a furrow on the convex as well as the concave side. It has at first no smell, but after some time acquires one which is acrid and disagreeable. A grain cut transversely and viewed under the microscope, appears composed of white brilliant grains resembling those of starch. The coloured pellicle which constitutes its exterior tunic, presents, when examined by the microscope in a similar manner, a violet-coloured mass with minute whitish specks scattered through it.

"*Experiments with different agents, with a view of ascer-*

* Vide *Annales de Chimie et de Physique*, tome iii. p. 337.

taining the best solvents of the colouring principle of ergot.—Several entire grains being put into a phial with alcohol did not sensibly colour it; but a quantity of the bruised seeds being treated with boiling alcohol, coloured the spirit a brownish red with a shade of violet.

"Water boiled in the same seeds acquired a beautiful violet red hue, less intense than that of the alcohol. Water alkalised by subcarbonate of potash, and cold, acquired a deep wine red hue, but the colour became more intense on the application of heat. Water acidulated by acetic acid was not remarkably coloured, even when heated; that by sulphuric acid acquired a pale red tinge; that by muriatic acid a similar but deeper hue; and that by tartaric acid a very pale rose colour; while by nitric acid it became yellow, the colour being destroyed.

"Water and alcohol, therefore, appear to be the true solvents of the colouring principles of ergot; but water possesses this property in the highest degree.

Effects of Re-agents on the different Solutions.

"The *Aqueous Solution* reddened litmus paper, precipitated acetate of lead lilac, and lime water light blue, whilst the supernatant fluid remained green. Acetate of iron threw down a blueish grey precipitate. The solution made with the *alkalized water* was precipitated lilac by acetate of lead, and purplish red by vinegar: the supernatant fluid remaining rose-coloured.

"*Experiments.*—1°. Two ounces of bruised ergot of rye were treated with boiling water, until it ceased to take up any colour; and the residue then treated with alcohol, which was boiled upon it. This alcoholic decoction, which was of a yellowish red colour, was then put into a retort, and distilled, in order to separate the alcohol, and procure the matter which it had taken up. The extract thus obtained, which was of a greenish brown colour, and had an acrid bitter taste, reddened the tincture of litmus, and swelled up when put upon live coals, emitting the odour of burnt bread.

"The aqueous decoction was rendered turbid by chlorine and galls; when evaporated, it yielded a brownish red extract,

of a taste at first sweet but afterwards bitter and nauseous. This extract reddened strongly litmus paper; but when bruised in a mortar with potash, it disengages a very fœtid odour of ammonia. The ergot, after having been thus treated with water and alcohol, was divided into several parcels; one of which, treated with subcarbonate of soda, only faintly coloured that alkali; the other, introduced into a small coated glass retort, yielded, on distillation, an oily product, of the consistence of butter. Paper reddened by an acid, and plunged into the air of the receiver, which contained the product, was restored to its natural colour: water agitated with this oil was a little coloured, acquired a slight degree of acidity and a bitter acrid taste; and when mixed with potash, it disengaged ammonia. The charcoal which remained in the retort, left, after its combustion, which was very difficult, a grey cinder, chiefly composed of phosphate of lime and magnesia, in combination with a little iron.

"2°. Twenty grains of bruised ergot, distilled on a slow fire, with four ounces of water, furnished a liquid slightly alkaline; for it changed to blue, litmus paper reddened by an acid; to green the syrup of violets; and formed precipitates with solutions of acetate of lead and of nitrate of mercury.

"3°. A certain quantity of the bruised seeds were washed on a silk sieve, to ascertain whether they contained starch; but a coloured matter only was obtained, which had none of the properties of starch. The water of the washings, being kept in a well corked flask, after some days disengaged an odour of ammonia mixed with that of putrid fish.

"4°. As the matter soluble in alcohol, obtained in the first experiment, had been mixed with the matter soluble in water, the operation was re-commenced in order to separate the pure resinous part. Twenty grammes* of the ergot were treated with alcohol at 40°, until it ceased to colour it. On evaporating the solution, a blueish red substance was procured, which had an acrid taste, and afterwards an oil resembling rancid fish-oil. The alcohol, which came over in distillation, emitted an insupportable odour of bilge water. The extract placed

* 310 Grains.

upon ardent coals, exhaled in burning the smell of volatilized fat. After having been thus exhausted by the alcohol the residue was boiled with water, which was coloured by it of a very beautiful violet red, and extracted a white oil that floated on its surface. This oil had no remarkable smell or taste. The colouring matter which was dissolved in the water, was reddened by the acid.

"5°. Forty grammes of bruised ergot of rye were distilled in a coated glass retort, to the neck of which a phial was adapted as a receiver. A gentle heat only was kept up for three quarters of an hour, after which it was augmented so as to redden the bottom of the retort. A large quantity of a thick disagreeable smelling oil came over. Litmus paper reddened by an acid, and plunged into the air of the receiver, was restored to its blue colour: and water, poured upon the oil to dissolve the fluid ammoniacal portion of it, became soft to the touch, and had all the appearance of a concentrated solution of soap; and, which was more remarkable, it was strongly alkaline, like the water which washed the oil procured from the ergot exhausted by water and alcohol; and distilled, was slightly acid. The charcoal which remained in the retort was very light; it weighed 7.700, so that the 40 grammes of the matter employed had lost 32.300.

"6°. Wishing to determine whether the ergot of rye, deprived of its colouring matter by water and alcohol, would yield a red colour to muriatic acid, a portion of it well bruised was put into this acid in a concentrated state. No remarkable action was at first perceptible; but in the space of twenty-four hours the acid had acquired a brownish-red colour.

"*Application of the colour of the Ergot to wool and silk.*—With the view of ascertaining whether this colour, which appeared to me analogous to that of orchil, could be applied as a dying material, I prepared some wool and silk; and after having allowed them to steep for twenty-four hours in a cold solution of alum, containing an eighth of cream of tartar, I plunged them into an infusion of ergot, heated to 60° (centig.): they took the colour well, and in a short time both substances were saturated with a yellowish-red colour, although the bath was purple; but the wool was deeper tinged

than the silk. This yellowish red hue seemed to depend on the cream of tartar; for some of the silk prepared with alum alone acquired in the same bath a lilac colour.

"The colour which wool and silk takes in the infusion of ergot, previously treated with alcohol, is a much purer violet; because the spirit takes up a yellow matter of an oily or resinous nature, which also attaches itself to these substances.

"Ergot, therefore, contains two colouring principles; one soluble in alcohol, of a resinous nature, and which impresses a reddish yellow tint; the other much less soluble in alcohol, but soluble in water, and which is violet like the juice of orchil, but differs from it in its little solubility in alcohol.

"I found, on endeavouring to discover how this colour is developed in ergot, that a colour of a similar shade may be obtained from the farina of wheat by dissolving it in concentrated muriatic acid; the colour developing itself as the solution of the flour proceeds until it is of a deep violet; but, after some hours, it passes to a purple, and continues so at least for several days. This solution does not become turbid, nor change its hue, on being diluted with water, but merely diminished in intensity, like any other colour. After some time, a light oily pellicle appears upon the surface of the diluted solution, similar to what is seen upon an infusion of the ergot when it it heated.

"It is probable, that this oily matter is not the consequence of the action of the muriatic acid upon the flour; for I have detected it in flour by means of alcohol. Conceiving it would be interesting to know, were it possible, to which of the elements of the flour the colouring matter was due, I dissolved one part of pure starch in muriatic acid; but no colour was developed. I then dissolved fresh gluten in muriatic acid, and obtained a blueish-grey colour. Observing that the two colouring principles which flour contained did not furnish the colour when separated, which they yielded when united in the flour, I began to prepare the mucoso saccharine principle which completes the composition of the flour, but when about to mix the acid solution of the gluten with that of the starch, I perceived almost instantaneously formed the beautiful colour of which I have spoken. I imagined that the colour

would have exactly resembled that of ergot, and this idea seemed the more probable, as I knew that gluten produced a violet colour during its decomposition in water*: but the following experiments changed my opinion; 1°. Alkalies poured in excess into the muriatic solution of wheat, changed this purple into a yellow, and it could not be again completely restored by the acids. I could not detect any disengagement of volatile alkali in thus saturating this solution. The colour of ergot is not sensibly changed by the alkalies; which only make it incline a little more to purple. 2°. This colour diluted with water alkalized to weaken the acid, is not fixed upon either wool or silk, like that of the ergot. We must therefore conclude, that the colour developed in wheat flour by means of muriatic acid, is not the same as that of ergot; and thence we can draw no conclusion from these experiments regarding the presence of gluten and starch in ergot. Yet if there exists no true gluten in ergot, it contains an azotised substance, since the action of heat upon it produces a considerable quantity of ammonia. It is even probable that it contains starch; but in a peculiar state of combination. The farina of rye, mixed with concentrated muriatic acid, coloured it first yellow and then red, similar to what occurs in the same acid with ergot which has been washed in water and alcohol.

"I made several experiments with starch and gluten in the muriatic acid, and observed, that the solution with starch may be diluted with water without affording any precipitation or losing its transparency; while that of the gluten is instantly precipitated in greyish flocculi, and the supernatant liquor remains of a blueish hue. I do not yet know whether gluten suffers any change of composition during its solution in muriatic acid; nor am I aware how a purple tint so beautiful and intense, is developed by the contact of flour and muriatic acid. Is it the effect of simple combination, or the product of decomposition? My time does not permit me to make the researches requisite for resolving these interesting questions.

"From the above experiments we may conclude that ergot contains—1°. A fawn-yellow colouring matter, soluble in al-

* Vide *Annales du Muséum*, vol. vii. p. 1.

cohol, and having a taste resembling that of fish-oil; 2°. a white oily matter, of a sweetish taste, which appears to be very abundant in the ergot; and is the same which M. Cornette obtained from it by simple pressure: 3°. a violet colouring principle, of the same shade as that of orchil, but differing from it by its solubility in alcohol, and which can be readily fixed on aluminated wool and silk: 4°. a free acid, of which I have not yet determined the species, but which I believe to be partly phosphoric, if we may be allowed to decide from its fixedness, and the precipitates which ergot forms with lime water, barytes water, and acetate of lead: 5°. a very abundant vegeto-animal substance, much disposed to putrefaction, and which furnishes a considerable quantity of thick oil and of ammonia by distillation: 6°. a small quantity of free ammonia, which can be obtained at the temperature of boiling water.

"After these chemical proofs to which we have submitted ergot, can we pronounce with certainty on the nature of that production? Is it a new vegetable which is formed in the bark which ought to contain the grain of the rye, as Decandolle supposes? or is it only a disease of the grain, produced by external causes, as has been hitherto generally believed? If, for the admission of this latter opinion, it be required that the same principles be found in the ergot as in the natural grains of rye, the opinion must be given up; as scarcely any starch, which the rye contains in great abundance, can be detected in it. Neither can gluten be separated from it, at least in its natural state; but there exists in it, as in healthy rye, a substance which, on being decomposed by heat, furnishes, like starch, an acid; and another which supplies ammonia, like gluten. If the physical properties also of ergot be examined, we shall be more inclined to regard it a disease of the grain: as it preserves, to a certain degree, its original form, and the remains of the furrow, which characterize the seeds of the cerealia. In the interior also the ergot presents a structure formed of white shining grains, like that of the natural rye.

"It would appear, then, that in this disease the rye chiefly suffers in its amylaceous principle; since scarcely any trace of it is to be found in the ergot, and the starch is replaced by a

mucous matter. The gluten is not in its natural state; but has suffered a change, which has modified its properties, and given birth to a thick oil and ammonia. Finally, I think we may regard the ergot of rye as the effect of putridity: and it is probable that it is the acrid matter, and the putrescent animal substance contained in the ergot, which produce the poisonous effect it has on the animal economy."

This paper is followed by a similar analysis of the Sclerotium *steriorum;* from which the following conclusions are drawn:

"1°. This species of Sclerotium differs from the ergot of rye in its infusion, being colourless and devoid of acidity; it is also precipitated more copiously by alcohol, galls, and chlorine; it is much more mucilaginous than that of the ergot; the watery extract has no acrid, disagreeable taste, like that of the ergot; on the contrary, it is sweet and mucilaginous, like that of mushrooms.

"2°. Submitted to distillation in a glass vessel, it does not yield as large a quantity of buteraceous oil as the ergot; the air of the receiver is alkaline like that of the ergot; but the product is more fluid and acid.

"3°. The ergot contains a fixed oil, which is not found in the sclerotium: it also contains exclusively a species of very acrid resin. Finally, ergot contains ready-formed ammonia, which may be procured at the temperature of boiling water; the sclerotium yields it only at a red heat. Such are the essential differences in the composition of these two productions."

Scarpa's Improved Operation for Aneurism.

[From the London Medical and Physical Journal, for May 1817.]

I BEG leave to transmit to you, for the information of your readers, a communication received in a letter from Professor Scarpa, dated March 30th, the object of which is the improvement of Mr. Hunter's Operation for Aneurism.

I am, Sir,

30, *Edgeware Road,*
April 18.

Your obedient servant,

JAMES BRIGGS.

"During the last year, I have made many experiments on animals after the manner of Jones, in order to determine the most useful method of tying the large arteries of the limbs. From these experiments I have drawn several useful results, which I shall shortly publish; but one of them has particularly arrested my attention, viz. that, on the fourth day from the operation, the ligature may be safely removed from the artery, as the cohesion and closure of the vessel is then sufficiently strong to resist the impetus of the blood; and, consequently, that it is not necessary, as is usual, to wait until the ulcerative process has loosened the ligature from the artery. From sixteen to twenty days of valuable time is thus lost, during its detachment, which might be much more advantageously employed in the treatment of the wound, freed from every extraneous body, and disposed to heal by the first intention.

"The first trial was made on a man, on account of a popliteal aneurism, three months ago. The ligature was removed from the femoral artery on the fourth day after the operation; and the result perfectly answered my expectation, the pulsation in the aneurism being no longer renewed. As soon as I have collected a sufficient number of facts similar to this, I design to give a full detailed account of them. I find, in performing the operation in this manner, that a small compress [cylinder] of cloth, imbued with ointment, interposed between the artery and ligature, is of great utility, and, indeed, indispensable, in rendering the removal of the ligature easy; whereas, when applied singly round the vessel, it is so imbedded between the internal and middle ruptured coats, as to make the division of it unusually difficult and dangerous. By this method, on the contrary, it may be readily and safely divided upon the compress.

Pavia, March 30, 1817."

We expect further information from this truly illustrious professor; but may, at present, be permitted to remark (as we did concerning the silken ligatures proposed by some English surgeons) that, after Mr. Hunter's operation for aneurism, and after a successful amputation on Mr. Allison's method,

we have often seen complete union by the first intent, excepting where it was interrupted by the ligatures, the ends of which were permitted to hang out till the parts attached to the arteries were, in a few days, so loosened by suppuration as to be removed without violence.

On a new Species of Resin from India. By J. F. Daniell, Esq. F.R.S. M.R.I.

[From the Journal of Science and the Arts, for March 1817.]

The resinous substance, the properties of which I shall endeavour to describe, was sent to me for examination by my friend Mr. H. B. Ker. Its history is this.—A lady brought from India a work-box that had been varnished: the varnish looked particularly clear, and had borne the heat of the climate without cracking or changing colour. Some distinguished artists saw it, and admired its peculiar beauty. The lady sent to the Rajah from whom she had originally procured it, and he remitted her an hamper full of stone bottles, containing the varnish, informing her that it was employed in all his ornamental work, and that it was used just as it was extracted from the tree from which it was procured, by incision. The name of the tree he unfortunately omitted to send. Its original consistence is that of cream, and when spread upon white paper, it dries quickly, is colourless, and of a brilliant polish, never cracking when exposed to the sun. The specimens which were sent over were put into the bottles upon being collected, and the precaution was taken of filling their necks with water. Notwithstanding this, their contents had become perfectly solid. In the state in which I received it the resin was opake, except just at the exterior coat, which was slightly translucent, of a very pale green colour, conchoidal fracture, and of a lustre intermediate between resin and wax. It was tasteless, easily pulverized, and inodorous. It inflamed with violence, and deposited much carbonaceous matter whilst burning, and diffused a pleasant aromatic smell. Its specific gravity was 1033.

Two hundred grains of it pulverized were boiled for three hours in half a pint of distilled water: it was then allowed to stand for twelve hours. The resin, on being collected and dried, had lost in weight only 0.8 of a grain. The infusion was reduced by evaporation, and it then presented the following properties. Muriate of tin threw down a dark brown powder; solution of chlorine in water produced a yellow precipitate; and muriate of alumina, when boiled with it, became cloudy. These are the indications of extractive matter.

It was then subjected to the action of cold alcohol. Much of it was dissolved, but an insoluble white powder remained, and did not decrease in quantity by boiling.

The same white substance was left when the resin was acted upon by ether and spirits of turpentine. It was collected upon a filter well washed with alcohol, dried at a gentle heat, and then weighed 75 grains.

The alcoholic solution was colourless, and had a very peculiar smell, resembling that of the bruised stalks of green vegetables: water instantly precipitated the resin. It was evaporated at a very gentle heat, and a light yellow transparent resin remained, which weighed 127 grains. The same resin was collected from the ethereal solution.

The undissolved residue was inflammable and burned with much smoke and a pleasant smell. It possessed no elasticity to the touch, but felt like powdered starch. It was not affected by any temperature under 360° of Fahrenheit's scale, when it began to fuse and melted by a continuation of the heat into a deep-brown transparent resin. The resin which had been dissolved by alcohol began to soften at 100°, and the original resin at 220°. The specific gravity of the most fusible was 932; of the least fusible 100.

From these experiments it appeared probable, that the peculiar good properties of this resin, as a varnish, arose from the resistance of the latter ingredient to the action of heat and chemical menstrua, and that in nature the most fusible resin was the solvent of the least fusible. I was the more anxious to find out some means of again combining the two in the fluid state, as I had little doubt but that the compound might prove an useful acquisition to the arts.

Acetic acid acted upon the resin in the same way as spirits of wine, turpentine, and ether: it dissolved one portion and left the other. Fifty grains of the natural resin and of the two separate resins were boiled in nitric acid. The action upon the most fusible was very violent. Nitrous gas was given off, and it was first converted into a deep orange-coloured substance, and then dissolved. The other two required longer digestion and a stronger acid, but were finally dissolved, after having been converted to a deep orange colour. Water added to the solutions produced a yellow precipitate, very bitter to the taste, and inflammable. Lime water produced no change, proving that no oxalic acid had been formed; but acetate of lead threw down a copious precipitate of malate of lead. It is remarkable, that the nitric solution, upon standing for some days, emitted a very strong smell of apples. It produced a slight cloud in solution of isinglass.

Solutions of the alkalies dissolved the most fusible resin copiously, the least fusible sparingly. They were precipitated by muriatic acid, and re-dissolved by excess.

Olive oil combined with the natural resin; but the compound was opake. When previously melted, it united with linseed oil, forming a drying varnish, but of a deep yellow colour. When subjected to distillation, a thick oil came over, possessing a strong empyreumatic colour. It was taken up by alcohol, from which it was again precipitated by the affusion of water. A small quantity of carbon was left in the retort.

From these experiments it appears, that the least fusible resin approaches in its characters to copal, differing, however, from it, in being insoluble in ether.

After many fruitless trials, I at length succeeded in effecting the solution of the resins, either combined or separate, by the following process. Equal parts of camphorated spirits of wine and oil of turpentine were put into a flask, and about an eighth part of ammonia added to them. The resin was then put in, in fine powder, and the whole boiled together. The turpentine does not unite with the spirits of wine; but from the agitation of boiling, they become intimately blended, and thus mixed, they act upon the resin and dissolve it completely. The addition of ammonia to either spirits of wine or

turpentine separately, is not sufficient for this purpose. Upon being allowed to stand at rest for some time, the liquid separates into two portions. The lower is transparent and brown, the upper opake; but in the course of a few days likewise becomes clear, and is nearly devoid of colour. It has a slight tinge of green, and when spread upon white paper, it quickly dries, and forms a remarkably tough and glossy varnish. Its specific gravity shows that it is chiefly composed of the spirits of wine; it retains, however, a strong smell of the turpentine.

Very little of the resin is left in solution in the lower stratum of liquid, but nearly all the camphor; and when poured upon paper, it evaporates, leaving it behind in white powder, without any stain.

The mean of the three analyses of the natural resin, one made by ether, and the other two by alcohol, gives the following result:

Extractive matter soluble in water	-	0.4
Resin soluble in alcohol and ether	-	62.6
Resin insoluble in alcohol and ether	-	37.0
		100.0

There can be little doubt but that if this resin can be obtained in sufficient quantity, that it may become a very valuable acquisition to the arts.

On some Combinations of Platinum. By Mr. John Thomas Cooper. *Addressed to the Editor.*

[From the Journal of Science and the Arts, for March 1817.]

I beg leave to transmit to you, an account of some new combinations of platinum, which I discovered while engaged in experiments on that metal: should you conceive them of sufficient interest, you will be pleased to afford them a place in your Journal.

I have obtained an alloy of this metal, different from any hitherto recorded; it is a compound of 7 parts platinum, 16

copper, and 1 zinc. The platinum and copper are first fused with the usual precaution of covering the metals with charcoal, and adding a flux of borax. When it is in perfect fusion, it is removed from the fire, the zinc is added, and after stirring the mass, an alloy will be formed, having the colour, malleability, and nearly the ductility of alloyed gold of 16 carats fine: so striking is its resemblance to that precious metal, that it might, with equal facility, be employed for the fabrication of articles of utility and ornament, as it never becomes oxidated by exposure to air, under ordinary circumstances, nor is it acted on by nitric acid, unless at a boiling heat.

I have stated this alloy to be eminently ductile and malleable, but it is only so when absolutely free from iron. I have found the presence of $\frac{1}{2}$ a grain of iron in 4oz. of the alloy, has rendered it very brittle, and has consequently impaired both its malleability and ductility,

The pure alloy can be rolled into laminæ, as thin as gold, and I have drawn it into wire $\frac{1}{350}$ of an inch in diameter, and in either of these states it can be dissolved in nitric acid, the specific gravity of which is not less than 1.25.

It has generally been stated, that there exist two oxides of platinum, an opinion with which I am willing to coincide, but I apprehend, that the proportions of oxygen are too highly rated, and that instead of oxides, triple salts, mixed with the oxides, have been obtained.

The two oxides are stated by Chenevix, to contain 7 and 13 oxygen, combined with 100 metal, and by Berzelius, 8.287 and 16.38 oxygen with 100 platinum; but the sequel, I think, shows that the protoxide has never before been obtained in a pure state, and that it consists of 100 platinum, united with only 4.317 oxygen. Indeed, the methods used by Chenevix, must have procured him triple salts. The mode adopted by Berzelius, seems equally liable to objection. He obtained his peroxide by precipitating muriate of platinum by quicksilver; but in such cases, it is extremely difficult to prevent adulteration of mercury in the precipitate; and his method of procuring the protoxide is not less objectionable. He obtains it by exposing muriate of platinum to heat, ascertain-

ing the quantity of chlorine given off, and estimating the quantity of oxygen that in other substances exists in the bases, united to an equal quantity of chlorine.

The protoxide may by obtained by pouring a perfectly neutral solution of mercury into a dilute solution of muriate of platinum, in hot water; a dense powder will precipitate, varying in colour from deep brown to yellow, and sometimes olive green. The powder, which is a compound of calomel and protoxide of platinum, is to be very carefully washed and dried, and then exposed to a heat, not more than sufficient to raise the calomel: that being done, there will remain an intense black powder, which is the protoxide of platinum.

In order to ascertain the proportion of oxygen in this oxide, which has always been much over-rated, I have undertaken a variety of experiments. 100 grains of the powder were heated to intense redness in a bent tube of green bottle glass, furnished with a cap and stop cock, and exhausted of common air. After giving off 12.5 cubic in. of oxygen, which were collected over mercury, the oxide was reduced to the metallic state: on examination, the metal was found to be very slightly coherent, but sufficiently so to enable me to remove it in one piece: it was now weighed, and found to have lost 4.7 grains: on examining the oxygen that had been liberated, it was found to be quite pure, as it required for its saturation, as nearly as possible, twice its volume of pure hydrogen.

100 grains of the oxide, mixed with 30 grains of pure lamp black, were introduced into a similar tube, with stop cock, &c. which, after exhaustion, was heated as before to redness: the cock was afterwards opened under mercury, and the gas received in a graduated jar: it measured 12.8 cubic in.; and this gas, on being exposed to a solution of caustic potass, was all absorbed, except a residuum of 0.35 cubic in., which possessed all the characters of azote. It is needless to state, that the gas absorbed, was carbonic acid.

The materials in the retort, being taken out and weighed, were found to have lost 6.3. gr: 12.5 cubic in. of carbonic acid were produced, which, reduced to standard temperature, would, according to De Saussure, weigh 5.96, leaving a dif-

ference of one-third of a grain, a trifling loss, probably arising from an increased pressure of the atmosphere.

A portion of the oxide, mixed with sulphur, was exposed to heat; sulphurous acid was disengaged, but, through accident, the results were not collected.

A curious property of this oxide should here be mentioned. When heated *per se*, or with combustibles, it is easily reduced, but when mixed with enamellers flux, it is capable of sustaining a very intense heat, without decomposition; indeed, it has withstood reduction in the most violent degree of heat I was able to give it. From this property, it will become an article of the greatest importance in the art of enamelling, as all blacks hitherto employed, are compounds of iron, cobalt, or manganese, which only afford a black colour, when used in body, the lighter washes appearing either purple, blue, or brown, as either of these oxides predominate. We can now, however, produce an enamel colour, which preserves an intense black in the lighter shades, and is, moreover, capable of sustaining the most violent fire, without injury, which none of the former colours will bear, without change; and hence I conceive the artist is at length in possession of one of the most important colours, which, among a few others, has long been a desideratum with enamellers. From the success I have hitherto met with, I may indulge in the hope, that my endeavours will enable me to succeed in producing, for the use of the enameller, a complete set of permanent colours and bases, the want of which has long been felt, and has probably retarded that branch of art from reaching the eminence it is capable of attaining.

There is another very valuable colour, produced by precipitating a neutral solution of platinum, by metallic tin, which is brown, and like the foregoing, is capable of bearing any degree of heat without decomposition. The process is tedious, requiring many days before the whole of the metal is precipitated. The precipitate of platinum, by muriate of tin, may also be employed, but it is neither so bright a colour, nor so dense as that by tin alone.

The black oxide of platinum, which I conceive to be the protoxide, is not soluble in any acid, except the muriatic. By

long digestion, with the assistance of heat, it dissolves in this acid without effervescence, and a dark coloured solution is obtained, similar to that produced by the action of nitro-muriatic acid on platinum; its habitudes being precisely those of that salt so obtained. It is capable of crystallizing, and its crystals present a similar aspect to those of the nitro-muriatic salt, or muriate of platinum, as it is called: when heated, water, at first, is disengaged, and lastly, considerable quantities of chlorine.

From the foregoing results, we may deduce the weight of an atom of platinum. The protoxide gives off by heat 12.5 cubic in. of oxygen, which, at the temperature of 48°, weigh 4.317 gr., which accords with its loss of weight, excepting a trifling loss of one-third of a grain, which may be attributed to the accidental presence of a minute quantity of moisture: from the result, we calculate

$$\left.\begin{matrix} 4.317 : 95.682 \\ 4.517 : 100. \end{matrix}\right\} :: 1 : 22.164$$

as the equivalent expression of an atom of platinum.

By pouring a neutral solution of tartrate of soda into muriate of platinum, moderately diluted, no action takes place while cold; but if it be heated to about 180° or 200° of Fahrenheit, a decomposition ensues, an instantaneous change of colour is produced, and a blackish powder precipitates. This powder requires considerable washing, with repeated affusions of boiling water to free it entirely from the acids; if it be now dried, it will appear of a grayish black colour. To determine its composition, it was dried on a sand bath, the temperature of which was 300°, in order to free it entirely from loose water: it was then heated in a tube similar to that employed in the former experiments, but nothing was given off except a small quantity of water too minute to be collected; its amount was estimated by heating 100 grains to redness by which it lost 2,8 grs.; no ascertainable quantity of gas was disengaged, for on opening the stop cock under mercury after the vessel had cooled, the mercury rushed in and filled the tube, with the exception of the remnant that had escaped the air pump. I made other experiments with precisely the same results; all therefore that I could obtain from this substance,

was platinum and water, and I consider it as a hydrate of that metal. I have already mentioned the necessity of washing this powder with large quantities of water, and if this be not attended to, both carbonic acid and carburetted hydrogen will be obtained on heating it, from the decomposition of the tartaric acid.

If we consider the equivalent of an atom of platinum to be 22,164, we must conclude the hydrate to be composed of two atoms of platinum and one of water; should it be considered like other hydrates as constituted of one atom of platinum and one of water, then the equivalent expression of the atom of platinum must be doubled, and it will be 44,328.

It possesses the peculiar character of other hydrates: when heated, it undergoes no change until it arrives at the point of ignition, when it suddenly becomes incandescent, and its particles are seen to approximate considerably. This effect is easily shown, by heating a few grains of the hydrate upon a strip of platinum, over a spirit lamp.

I have reduced considerable quantities of this hydrate in crucibles of various kinds, and have always found it to occupy less than one-eighth of the bulk it filled before ignition, even if pressed together with considerable force: after undergoing this process, its particles are so agglutinated, as to resist separation, and when struck by the blows of a hammer, upon a hard surface, it extends considerably before it separates; by repeated heating and hammering, it may be wrought into a solid bar. This will afford the most ready and easy method of making malleable platinum, an operation allowed to be difficult of execution. I have thus succeeded in reducing it into bars which have undergone the operation of rolling into very fine laminæ, and have also drawn it into wire $\frac{1}{350}$ of an inch in diameter.

I am at present engaged in some other experiments upon this subject, of which I shall send you the results.

Very respectfully yours,

J. T. COOPER.

76, *Drury-lane*,
March 16*th*, 1817.

Some Experiments and Observations on a new Acid Substance.

By M. FARADAY, Chem. Assistant in the Royal Institution.

[From the Journal of Science and the Arts, for March 1817.]

SIR H. DAVY, during his investigations on flame, discovered a method of exhibiting those combinations of bodies, which he had ascertained to take place at temperatures below that sufficient to inflame them; and whilst pursuing his enquiries on these new and singular phenomena, observed the formation of a peculiar acid body from ether. He has mentioned this body in a Paper read before the Royal Society, which will shortly be published; and he requested me to make some experiments on this substance, the results of which I shall now at his desire detail.

When a fine platina wire is heated and placed over the surface of ether, in an open glass, a pale lambent flame plays around it, and peculiar pungent fumes arise. Generally the heat of the wire is increased; it becoming at last red, and even white hot, and frequently inflaming the ether. If a heated glass or earthen-ware rod be placed over the surface of the ether, the pale flame is seen, and the vapours arise, but the effect soon ceases, from the cooling of the heated substance. The production of these fumes takes place at all temperatures, from a heat a little above the boiling point of mercury, until the ether is inflamed.

The vapours are very acrid and pungent, and very much resemble chlorine in smell: they affect the eyes in a manner similar to azotane: they redden moistened litmus paper. When a rod dipped in ammonia is held in them, they combine with the alkali, producing white fumes.

Sulphuric ether produces them most abundantly, but they may be obtained from the other ethers also. When nitric ether is used, as it inflames at a much lower temperature, it is more difficult so to manage the wire, as to produce the vapours: but if it be previously mixed with solution of potash, or other alkalies, then it succeeds as well as sulphuric ether, and the

vapours formed, being unmixed with any nitrous vapours, are unequivocal in their characters.

Muriatic ether mixed with potash also produces the peculiar vapour, but not so abundantly as sulphuric or nitric ether. The wire easily retains its temperature, but does not very often inflame the fluid.

Acetic ether requires to be warmed before it will succeed well in preserving the wire at a red heat; and I have never yet observed the formation of the acid fumes from it.

I endeavoured to obtain a quantity of the acid in a pure form: for this purpose, some ether was thrown into a bladder, which was then filled with common air, and the mixture of air and vapour made to traverse a heated glass tube, containing pieces of platina wire and foil; the end of the tube descended into a bottle placed in a freezing mixture, and after passing many bladders of air slowly through the tube, the results were examined. Some charcoal remained on the pieces of platina; much carbonic acid had been formed and dissipated; and there was found in the bottle an aqueous solution of the peculiar acid.

The quantity obtained in this way, even after the process had been continued for some hours, was very small. The solution was clear and colourless, of a slightly acid taste and strong irritating smell. It reddened litmus paper, as did also its vapours. When heated, the acid was quickly dissipated, leaving, on being evaporated to dryness, a slight coally mark on the capsule.

I distilled some of the solution from fused muriate of lime, hoping to procure the acid in its pure form, but obtained no decisive results. No permanent gas was given off, nor did any fluid distil over, until the acid was decomposed by the heat; but the quantity was too small to present distinct phenomena.

The solution of the acid added to ammonia, combined with it and formed a neutral salt, which, by careful evaporation, was obtained in the solid form. This was very volatile, rising at a temperature even below that of boiling water, and producing a peculiar fœtid smell, not much like the acid, but quite as unpleasant.

Muriate of lime decomposes the carbonate of ammonia, a

triple muriate being formed, and carbonic acid separating; and as the new acid appeared to possess affinities in some cases not even so strong as those of carbonic acid, I hoped to obtain it pure by a similar decomposition; but on making the experiment, was still unsuccessful. The salt being distilled with fused muriate of lime, nothing came over but a small quantity of a fluid, possessing no acid properties, and appearing to be water: a decomposition had however taken place; for on increasing the heat, ammonia was driven over; but here, as before, the small quantity I could use was against the experiment.

The acid solution added to potash and soda saturated them, and rendered them neutral. The solution with potash bore the application of heat for some time, until a certain degree of concentration being obtained, it began to decompose, and soon became strongly alkaline, the acid flying off. When in this state, if suffered to cool, it crystallised; and if left exposed to the air, soon deliquesced. If evaporated to dryness and heated, the subsalt was decomposed, and the acid destroyed.

The neutral alkaline solutions precipitated salts of silver and mercury, but not of other metals: the precipitates were soluble in a large proportion of water.

The acid solution decomposes the carbonate and subcarbonate of potash, soda, and ammonia, giving off carbonic acid: it also decomposes the bi-carbonate of magnesia. It has no action on the carbonate of lime, even when newly precipitated; and in several other cases I have thought its affinities were weaker than those of carbonic acid.

The salts which it forms with the alkalies are decomposed by the common acids, and the peculiar vapour flies off; so much however is generally decomposed by the acid or heat (if evaporated), as to discolour the residuum.

From the small quantities in which I have been able to form it, I had no hope of ascertaining the proportion of its constituent parts; but from some minute experiments, I judge it to be composed of oxygen, hydrogen, and charcoal. A neutral solution of it with potash was evaporated to dryness and distilled, 2.17 cubical inches of gas were received over mer-

cury, and much charcoal remained with the alkali in the retort. The gas rendered lime water turbid, and being agitated with solution of potash, became 1.6 cubical inches. This was inflammable, and burned with a light flame; four volumes of it detonated by the electric spark with six of oxygen, became two, which with four of nitrous gas became two; so that it appeared to be a mixture of carbonic oxide and hydro-carbonate. Oxygen, hydrogen, and charcoal may therefore be considered as the elements of the acid: the latter, from the quantity left in the retort, appearing to be in very great proportion.

The peculiar character of this acid is the irritating effect it produces on the eyes and nostrils. In this it somewhat resembles the oxalic acid, but is more pungent. This character belongs in part to its salts; at least its combination with ammonia, when volatilised, possesses similar powers, though not so strong.

Among other fruitless attempts to obtain it, I used an atmosphere of oxygen and carbonic acid in place of common air, and receiving the gas over mercury, was in hopes of separating the carbonic acid by lime or some other agent, which would leave the new acid. I also distilled the neutral solution of it with potash, until rendered alkaline; but the very small quantities in which it is formed, and the ease with which it quits its compounds, have prevented the performance of any decisive experiments upon it; and until some other process has been discovered for producing it, there is little hopes of its being obtained in the pure state.

On the Oopas, or Poison Tree of Java.

BY T HORSFIELD, M. D.

[From the Journal of Science and the Arts, No. IV.]

THE singular imposition on the scientific world, respecting the Oopas tree, published in Holland in 1783, makes the account of Dr. Horsfield, given in this volume, particularly interesting.

The history and origin of this celebrated forgery still re-

main a mystery. Foersch, who put his name to the publication, was a surgeon in the Dutch East India Company's service. Having hastily picked up some vague information concerning the oopas, he carried it to Europe, where his notes were arranged, doubtless by a different hand, in such a form, as by their plausibility and appearance of truth, to be generally credited. It is in no small degree surprising that so palpable a falsehood should have been asserted with so much boldness, and have remained so long without refutation—or that a subject of a nature so curious and so easily investigated, relating to its principal colony, should not have been enquired into, and corrected by the naturalists of the mother country.

To a person in any degree acquainted with the geography of the island, with the manners of the Princes of Java, and their relation to the Dutch Government at that period, or with its internal history during the last 50 years, the first glance at the account of Foersch must have evinced its falsity and misrepresentation.

But though the account just mentioned, in so far as relates to the situation of the poison tree, to its effects on the surrounding country, and to the application said to have been made of the oopas on criminals in different parts of the island, as well as the description of the poisonous substance itself, and its mode of collection, has been demonstrated to be an extravagant forgery,—the existence of a tree on Java, from whose sap a poison is prepared, equal in fatality, when thrown into the circulation, to the strongest animal poisons hitherto known, is a fact, which is fully established by the author of the present paper.

The tree which produces this poison is called, antshar, and grows in the eastern extremity of the island.

The work of Rumphius contains a long account of the oopas, under the denomination of arbor toxicaria: the tree does not grow on Amboina, and his description was made from the information he obtained from Macassar.

His figure was drawn from a branch of that which was called the male tree, sent to him from the same place, and established the identity of the poison tree of Macassar and the other eastern islands with the antshar of Java.

The account of this author is too extensive to be abridged in this place; it concentrates all that has till lately been published on this subject. It is highly interesting, as it gives an account of the effects of the poisoned darts, formerly employed in the wars of the eastern islands, on the human system, and of the remedies by which their effect was counteracted and cured.

The simple sap of the arbor toxicaria, (according to Rumphius,) is harmless, and requires the addition of ginger and several substances analogous to it, to render it active and mortal. In so far it agrees with the antshar, which, in its simple state, is supposed to be inert; and before being used as a poison, is subjected to a preparation, which will be described after the history of the tree. The same effervescence and boiling which occurs on the mixture of the substances added to the milky juice by the Javanese in Blambangan, has been observed in the preparation of the poison of Macassar, and in proportion to the violence of these effects the poison is supposed to be active.

Besides the true poison tree, the oopas of the eastern islands, and the antshar of the Javanese, Java produces a shrub, which, as far as observations have hitherto been made, is peculiar to the same, and by a different mode of preparation, furnishes a poison far exceeding the oopas in violence. Its name is tshettik.

The antshar is one of the largest trees in the forest of Java. The stem is cylindrical, perpendicular, and rises completely naked to the height of sixty, seventy, or eighty feet. It is covered with a whitish bark, slightly bursting in longitudinal furrows: near the ground this bark is, in old trees, more than half an inch thick; and, upon being wounded, yields plentifully the milky juice from which the celebrated poison is prepared. A puncture or incision being made in the tree, the juice or sap appears oozing out, of a yellowish colour; from old trees, paler: and nearly white from young ones: when exposed to the air, its surface becomes brown. The consistence very much resembles milk, only it is thicker, and viscid. This sap is contained in the true bark (or cortex), which, when

punctured, yields a considerable quantity, so that, in a short time, a cup full may be collected from a large tree.

Previous to the season of flowering, about the beginning of June, the tree sheds its leaves, which re-appear when the male flowers have completed the office of fecundation. It delights in a fertile and not very elevated soil, and is only found in the largest forests. Dr. H. first met with it (the antshar) in the province of Poegar, on his way to Banjoowangee. In clearing the new grounds in the environs of Banjoowangee for cultivation, it is with much difficulty the inhabitants can be made to approach the tree, as they dread the cutaneous eruption which it is known to produce when newly cut down. But, except when the tree is largely wounded, or when it is felled, by which a large portion of the juice is disengaged, the effluvia of which mixing with the atmosphere, affect the persons exposed to it, with the symptoms just mentioned, the tree may be approached and ascended like the other common trees in the forests.

The antshar, Dr. H. observes, like the trees in its neighbourhood, is on all sides surrounded by shrubs and plants: in no instance have I observed the ground naked or barren in its immediate circumference.

The largest tree I met with in Blambangan was so closely environed by the common trees and shrubs of the forest in which it grew, that it was with difficulty I could approach it. And at the time I visited the tree, and collected the juice, I was forcibly struck with the egregious misrepresentation of Foersch. Several young trees spontaneously sprung from seeds that had fallen from the parent, reminding me of a line in Darwin's Botanic Garden,

"Chained at his root two scion Demons dwell."

While in recalling his beautiful description of the oopas, my vicinity to the tree gave me reason to rejoice that it is founded on fiction.

The tshettik is a large winding shrub. In large individuals it has a diameter of two or three inches, covered with a reddish brown bark, containing a juice of the same colour, of a peculiar pungent, and somewhat nauseous odour.

From this bark the poison is prepared.

It is very rarely met with, even in the wilderness of Blambangan.

The process of preparing the antshar was performed for me by an old Javanese, who was celebrated for his superior skill in preparing the poison. About eight ounces of the juice of the antshar, which had been collected the preceding evening, in the usual manner, and preserved in the joint of a bamboo, was carefully strained into a bowl. The sap of the following substances, which had been finely grated and bruised, was carefully expressed and poured into it, viz.—Arum, Nampoo, (Javanese,) Kaemferia, Galanga, Kontshur, Amomum, Bengley, (a variety of zerumbed,) common onion and garlic, of each about half a dram; the same quantity of finely powdered black pepper was then added, and the mixure stirred.

The preparer now took an entire fruit of the capsicum fruticosum or Guinea pepper, and having opened it, he carefully separated a single seed, and placed it on the fluid in the middle of the bowl.

The seed immediately began to reel round rapidly, now forming a regular circle, then darting towards the margin of the cup, with a perceptible commotion on the surface of the liquor, which continued about one minute. Being completely at rest, the same quantity of pepper was again added, and another seed of the capsicum laid on as before: a similar commotion took place in the fluid, but in a less degree, and the seed was carried round with diminished rapidity. The addition of the same quantity of pepper was repeated a third time, when a seed of the capsicum being carefully placed in the centre of the fluid, remained quiet, forming a regular circle about itself, in the fluid, resembling the halo of the moon. This is considered as a sign that the preparation of the poison is complete.

The tshettik is prepared by separating the bark of the root, and boiling it, and after separating the bark from the water, exposing the extract to the fire till it is about the consistence of syrup. After this the preparation is the same as of the antshar.

An account of 26 experiments, is detailed by Dr. Hors-

field, on which he remarks, that he has selected from a large number of experiments, those only which are particularly demonstrative of the effects of the antshar and of the tshettik, when introduced into the circulation. The poison was always applied by a pointed dart or arrow, made of bamboo.

The operation of the two different poisons on the animal system is essentially different.

The first 17 experiments were made with the antshar; the rapidity of its effect depends, in a great degree, on the size of the vessels wounded, and on the quantity of poison carried into the circulation.

In the first experiment, it induced death in 26 minutes,—in the second, in 13 minutes. The poison from different parts of the island has been found nearly equal in activity.

The common train of symptoms is, a trembling and shivering of the extremities, restlessness, discharges from the bowels, drooping and faintness, slight spasms and convulsions, hasty breathing, an increased flow of saliva, spasmodic contractions of the pectoral and abdominal muscles, retching, vomiting, excremental vomiting, frothy vomiting, great agony, laborious breathing, violent and repeated convulsions, death.

The effects are nearly the same on quadrupeds, in whatever part of the body the wound is made. It sometimes acts with so much force, that not all the symptoms enumerated are observed.

The oopas appears to affect different quadrupeds with nearly equal force, proportionate, in some degree, to their size and disposition. To dogs it proved mortal, in most experiments, within an hour. A mouse died in ten minutes; a monkey in seven minutes; a cat in fifteen minutes.

A buffalo, one of the largest quadrupeds of the island, died in two hours and ten minutes, though the quantity of poison introduced in this experiment was proportioned to that which was thrown into the system in the experiments on smaller animals.

If the simple or unprepared sap is mixed with the extract of tobacco or stramonium, (instead of the spices mentioned in the account of the preparation,) it is rendered equally, perhaps more active.

Even the pure juice, unmixed and unprepared, appears to act with a force equal to that which has undergone the preparative process, according to the manner of the Javanese at Blambagan.*

Birds are very differently affected by this poison. Fowls have a peculiar capacity to resist its effects. A fowl died 24 hours after the wound; others have recovered after being partially affected.

In regard to the experiments made with the poison prepared from tshettik, its operation is far more violent and rapid than that of the antshar, and it affects the animal system in a different manner; while the antshar operates chiefly on the stomach and alimentary canal, the respiration and circulation, the tshettik is determined to the brain and nervous system.†

A relative comparison of the appearances on dissection, demonstrates, in a striking manner, the peculiar operation of each.

After the previous symptoms of faintness, drowsiness, and slight convulsions, it acts by a sudden impulse, which, like a violent apoplexy, prostrates at once the whole nervous system.

In the two experiments, this sudden effect took place on the sixth minute after the wound; and in another on the seventh minute, the animals suddenly started, fell down head foremost, and continued in convulsions till death ensued.

This poison affects fowls in a much more violent manner than that of the antshar, death having frequently occurred within the space of a minute after the puncture with a poisoned dart.

The simple unmixed decoction of the bark of the root of the tshettik, is nearly as active as the poison prepared according to the process above related.

* We certainly were surprised at the doctor's statement of the process of preparation, which, in fact, seems to add nothing to the violence of the poison.

† Mr. Brodie, in a paper on vegetable poisons, (Phil. Trans. 1811) has given an account of some experiments made by him with the *upas antiar*, from Java, furnished by Mr. Marsden, from which it appears, that when inserted in a wound, it produces death, (as the infusion of tobacco does, when injected into the intestines,) by rendering the heart insensible to the stimulus of the blood, and stopping the circulation.

The resinous portion of the bark is by no means so active as the particles soluble in water.

Taken into the stomach of quadrupeds the tshettik likewise acts as a most violent poison, but it requires about twice the period to produce the same effect which a wound produces; but the stomachs of fowls resist its operation.

The poison of antshar does by no means act so violently on quadrupeds as that of the tshettik. Dr. H. observes he gave it to a dog; it produced at first nearly the same symptoms as a puncture; oppression of the head, twitchings, faintness, laborious respiration, violent contraction of the pectoral and abdominal muscles, an increased flow of saliva, vomiting, great restlessness and agony, &c., which continued nearly two hours; but after the complete evacuation of the stomach by vomiting, the animal gradually recovered.

Rumphius asserts that a small quantity may be taken internally as a medicine.

In animals killed by the antshar, the large vessels in the thorax, the aorta and venæ cavæ were, in every instance, found in an excessive degree of distention: the viscera in the vicinity of the source of circulation, especially the lungs, were uniformly filled in a preternatural degree with blood; which in this viscus and in the aorta, still retained a florid colour, and was completely oxygenated. On puncturing these vessels, it bounded out with the elasticity and spring of life. The vessels of the liver, of the stomach, and intestines, and of the viscera of the abdomen in general, were also more than naturally distended, but not in the same degree as those of the breast. In the cavity of the abdomen a small quantity of serum was sometimes effused.

The stomach was always distended with air, and in those instances in which the action of the poison was gradual, and in which vomiting supervened in the course of the symptoms, its internal coat was covered with froth.

The brain indicated less of the action of the poison, than the viscera of the thorax and abdomen. In some instances it was perfectly natural—in others, marks of a small degree of inflammation were discovered.

An undulatory motion of the skin and of the divided muscles was very evident in some of the dissected animals.

The appearances observed in the animals destroyed by the tshettik were very different. In a number of dissections, the viscera of the thorax and abdomen were found nearly in a natural state, and the large vessels of the thorax exhibited that condition in which they are usually found after death from other poisons.

But the brain and the dura mater showed marks of a most violent and excessive affection. In some instances the inflammation and redness of the dura mater was so strong, that on first inspection Dr. H. supposed it to be the consequence of a blow previously received, until he found by repeated examinations, that this is a universal appearance after death from tshettik.

Rumphius had an opportunity of personally observing the effect of the poisoned darts or arrows on the human system, as they were used by the natives of Macassar, in their attack on Amboina, about the year 1650.

Speaking of their operation, he says, the poison touching the warm blood, is instantly carried through the whole body, so that it may be felt in all the veins, and causes an excessive burning, and violent turning in the head, which is followed by fainting and death.

After having proved mortal to many of the Dutch soldiers in Amboina and Macassar, they are said to have finally discovered an almost infallible remedy in the root of the Crinum asiaticum, (called by Rumphius, radix toxicaria,) which, if timely applied, counteracted, by its violent emetic effect, the force of the oopas.

An intelligent Javanese informed Dr. Horsfield, that an inhabitant was wounded in a clandestine manner, by an arrow thrown from a blow pipe, in the fore arm, near the articulation of the elbow. In about fifteen minutes he became drowsy, after which he was seized with vomiting, became delirious, and in less than half an hour he died.

Remarks on the Preservation of Lime Water, by H. DEWAR, M. D. Fellow of the Royal College of Physicians, Edinburgh.

[From the Edinburgh Medical and Surgical Journal for April 1817.]

DEAR SIR,—Considering the present mode of preserving lime water as susceptible of improvement, I shall, in a few words, communicate to you my observations on the subject, that, if you see proper, you may insert them in the Edinburgh Medical and Surgical Journal.

According to the plan usually followed, the water, after being impregnated, is filtered, and put up in large bottles, from which it is removed to smaller ones from time to time, as it is needed. These smaller bottles are still of such size, that they must be repeatedly opened and stopped before their contents are exhausted. This evidently brings along with it the frequent admission of atmospheric air, in quantities proportioned to the space left above the solution in the bottles. Hence we generally find the bottle in common use is more or less dimmed with a precipitate of carbonate of lime, formed by the carbonic acid of the atmosphere, which renders the solution turbid, and gives us reason to conclude, that it must be impaired in strength.

Wishing to have a quantity of good lime-water constantly at hand, for the sake of experiments, I have found the following method completely satisfactory: Instead of filtering the solution, to keep it in contact with a quantity of quick-lime, in a tall wide-mouthed bottle, and to decant from the upper part, as much as is at any time wanted; to fill the bottle immediately again with water, and shake it in the same manner as when the lime-water is first made. This excludes all carbonic acid, and affords a fresh supply of the solution. It is preferable to the plan of keeping quick-lime bottled up in a dry state, which is apt to break the bottles; and, when at any time exposed, exhibits a more extensive surface to the action of carbonic acid.

When the simple plan now described is followed, even though precipitation by the carbonic acid should, in a slight degree, take place, the solution thus weakened is quickly resaturated by the presence of the quick-lime. Thus it is always kept in its strongest state, and may be obtained perfectly limpid. The trouble of inquiring frequently for fresh burned limestone, which, in some situations, may be considerable, is avoided, as well as that of filtering. This would, indeed, be a paltry recommendation, were it not that the trouble is of no utility, every object being more advantageously obtained without it. The filtering, besides, implies a degree of exposure which must be injurious.

I can conceive no objection to which this little plan of chemical and pharmaceutical economy is liable. On the contrary, I trust that it requires only to be mentioned to have its advantages appreciated, and to be generally adopted. Apothecaries and druggists may keep their stock in very tall and wide-mouthed bottles, with quick-lime at the bottom, from which it may from time to time be drawn off, either by the use of a syphon, or by careful decantation, and put aside in vials containing the quantities most generally asked for.

George Street, Edinburgh, Dec. 3, 1816.

Case of Un-united Fracture of the Os Humeri, treated successfully by the seton. By JOSIAS STANSFIELD, Esq., Surgeon to the Leeds Infirmary.

[From the Medico-Chirurgical Transactions, Vol. VII. Part I.]

WILLIAM FISHER, aged 48, a strong healthy man, was thrown from a stage-coach on the 4th of December 1814, and fractured his left arm. He was immediately taken to a neighbouring surgeon, who adjusted the fracture, and applied a roller and splints; these were removed at the end of four or five weeks, when it was discovered that no union whatever had taken place. Frictions were then employed, and the parts daily bathed with hot water, but without producing any beneficial effect, and the patient's arm continued in a useless state

to July 1815, the period of his admission into the Leeds Infirmary. On examination I found very considerable motion at the fractured part, so that the two portions of bone could be made to form a very considerable angle; he was also unable to raise the arm from the side. The fracture was very oblique, the extent of fractured surface being, as nearly as I could ascertain, four inches; commencing near the insertion of the deltoid muscle, and terminating within two or three inches of the elbow joint. Both arms were equal in length. By pressing deeply between the biceps muscle and the bone, I could feel the sulcus of the fracture, and it was indistinctly perceptible on the outer side. The nature of this injury being favourable for the passage of a seton between the fractured ends, as recommended by Dr. Physick of America, I determined to try this mode of treatment; and accordingly on the 28th of July, I commenced the operation, by making a division of the integuments, an inch and a half long, on either side of the bone, about the centre of the fracture; the biceps muscle was then drawn inwards, and the cellular membrane divided, down to the sulcus; on the outer side I was obliged to divide some fibres of the triceps muscle; a curved seton needle was now easily pushed betwixt the ends, the intervening substance being very soft. The seton string consisted of a skein of silk, doubled and well waxed. The lips of the wounds were drawn together by strips of adhesive plaister, and a compress and bandage applied. On the following day, the patient was in very great pain, and had a smart attack of fever, which induced me to take off the dressings, and apply a bread poultice, adopting at the same time the antiphlogistic regimen. This plan was continued till the inflammation had subsided, and suppuration was completely established. During the first fortnight, the slightest motion of the arm gave him very acute pain; but by the 16th of August being comparatively easy, I dressed the wounds with ointment and lint, and applied a compress and splints, supporting the whole by two leather straps; his arm was allowed to hang by his side, by which it was kept straight, and this position was the easiest to him.

He was now ordered to get up daily, and walk out in the open air as much as he could bear to do without fatigue; to

have as much meat and porter as agreed with him, and to take the decoction of bark with dilute vitriolic acid. From this period the wounds were dressed daily, and the arm kept as clean as possible, which prevented the accession of any inflammation of the skin. The seton string was moved backwards and forwards several times at each dressing, in order to preserve the effect of the stimulus, which gave the patient considerable pain. By the 26th of August the arm had gained some strength, as it could be raised a little from his side without giving way. On the 8th of September, a seton string of half the size was passed, from which time he experienced no uneasiness. September 18th, the arm could be raised to a horizontal position without bending, and he could himself raise it very considerably. By the 30th of September no motion whatever was perceptible at the fractured part, but as he remained easy, the seton string was not withdrawn till the 3d of October. The wounds soon after healed, and he was directed to wear a bandage round his arm for some weeks, also to rub it extremely well, and use it freely. I saw him again on the 3d of November, when he could carry his hand to the back of his head, his arm feeling as strong and useful as before the accident.

Leeds, 20*th December*, 1815.

History of a Tumor successfully removed from the Face and Neck, by previously tying the Carotid Artery. By WILLIAM GOODLAD, Esq., member of the Royal College of Surgeons, and Surgeon at Bury, Lancashire.

[From the Medico-Chirurgical Transactions, Vol. VII. Part I.]

THE carotid arteries furnish so large a portion of the blood transmitted to the brain, that practitioners have been till very lately deterred from securing them by ligature, lest the functions of that important organ should be so much impaired as to destroy life. Mr. Abernethy was the first who tied the left carotid, which he did in a man who had the internal, and many branches of the external artery, divided by the horn of a

cow. The patient lived only thirty hours, and died from the functions of the brain being injured.

This operation was, therefore, so little encouraging, as to be justifiable only where death must otherwise be inevitable; since that period the carotid has been tied by Mr. A. Cooper, and by Mr. Travers; but I believe there is no instance on record of its being secured by ligature, in order to render the removal of a tumor practicable; the following instance of its successful adoption will therefore, I hope, be worthy the acceptance of the society.

On Thursday, August 31st, I was desired to visit Mrs. Kershaw, of Middleton, a thin, middle aged woman, upon whose case a consultation had been held the preceding day, at Manchester; the general result of which was that no operation was advisable. She had a large tumor extending from near the external canthus of the left eye, down the cheek to the infra-orbitary foramen and the root of the ear, which was elevated by the tumor, and, passing under it, it extended behind the mastoid process. Anteriorly it extended to the chin, and to the trachea, which it partially covered, and hung pendulous over the clavicle. The circumference of the base of the tumor, when last measured, was twenty inches, since which period it had increased rapidly, but I regret not having ascertained its exact size; it must, however, from the space it occupied, have been at least twenty-eight inches.

In the upper portion, comprised between the cornu of the os hyoides upwards to above the zygoma, the tumor in the base was as large as, or larger than in its middle or apex, but below this point, its attachment to the neck was less extensive; and though hanging pendulous over the clavicle, its lowest connexion with the neck was three quarters of an inch distant from that bone. On elevating the tumor in this lower space with a hand on each side, and passing the fingers at the same time under it, it might clearly be ascertained that there was no connexion with the vessels; but as it hung over the trachea, and was connected with it, it required a very careful examination to be convinced that they were not united. The cornu of the os hyoides was however moveable under the tumor, and independent of it; respiration was tolerably free,

when in an erect posture, and on passing the fingers forcibly between these parts, I was pretty well convinced that they might be separated. The œsophagus here was too deep to be implicated in the disease.

Above the cornu of the hyoid bone, the base of the tumor was very extensive, and deep, impeding deglutition considerably. On directing the finger, passed into the mouth, towards the base of the ramus and angle of the maxillary bone, and into the fauces, the intervening substance appeared considerable, and authorized an opinion that the fauces would not be cut into, nor indeed exposed, by its removal. The submaxillary gland was pressed inwards, but did not appear enlarged or hardened, and the membrane of the cheek was also healthy, though the tumor appeared in contact with it.

The disease commenced behind the angle of the jaw, and now extended beyond the mastoid process, and was so closely connected with the subjacent parts, that the finger could not be passed under it. Its connexions here, therefore, were only to be ascertained by collateral circumstances; and as the whole site of the parotid gland was covered by it, it became a question worthy of serious consideration, how far that substance was enveloped in the disease, particularly as it had been stated on most respectable authority, that its removal was impracticable. The patient's being able to open the mouth and masticate, was a complete proof, that if the whole substance of the gland were diseased, it had become dragged from its situation by the weight of the tumor, and that the tumor itself did not dip into the fossa behind it. Yet every other circumstance rendered it certain that the parotid gland was enveloped in the disease, which was indeed verified in the operation. But the extent of the disease here became of less importance if the carotid artery were previously secured, as I intended. I ought to have observed that the tumor was perfectly moveable, though its motions were very limited, and that it had, therefore no bony attachment either to the jaw or to the zygoma.

The surface of the tumor was divided into large tuberculi, and the apex of each tubercle was rendered more prominent by a collection of fluid: it was fleshy, but had neither the hardness nor any other external character of carcinoma.

There was no absorbent gland affected in its neighbourhood, and though ulcerated in two points, one of which was extensive, the aspect of the ulcer was not forbidding, being partially granulating and partly sloughing. Fungus hæmatodes was therefore not to be dreaded. Yet a discouraging circumstance arose from a charlatan's having, as he believed, succeeded in removing the complaint by the knife, at an early period of its history, on which occasion the hæmorrhage was very alarming. After a short time the disease reappeared, and had only been nine months in attaining its present enormous size. Large varicose veins spread over the surface, and as the skin was uniformly diseased, ulceration might be expected to extend to them, and hæmorrhage to be an inevitable consequence.

The woman's health was tolerable, though her strength was reduced; and the weight of the tumor, which she generally rested on the shoulder, prevented her from using exercise. She had applied to many practitioners, and to a neighbouring infirmary; but the result had uniformly been unfavourable to her wishes. The consultation which I have mentioned, was called by my friend Mr. Killer, to whom, at the recommendation of a practitioner in the neighbourhood, she had applied as a last resource, and nothing discouraged at the result of it, she was resolutely determined to have the tumor removed, if any one would second her noble resolution by making the attempt.

The objections to the operation were twofold, and depended on the hæmorrhage threatening immediately to destroy the patient; or, this being removed, on the disease being reproduced. The former objection was obviated by tying the carotid artery, and there was no doubt of the disease being removeable except at the part I have mentioned; and as it was agreed by all the consultants that her death was otherwise inevitable, and must soon take place, there appeared at least a chance of her being saved; and however small that chance, I considered a surgeon justifiable in seizing it. The question then turned on the propriety of tying the carotid artery. I had a firm conviction that in both Mr. A. Cooper's cases the patient died,*

* One of these patients recovered.

and this conviction was so strong that I did not refer to them. But though this had been the fact, no surgeon would hesitate, in cases of aneurism, to give his patient the small chance of recovery which an operation offered, after the encouragement, which the insulated instance, as I believed, of success in Mr. Travers's case, afforded, rather than suffer him to die inevitably by the progress of the disease; and if we consider the causes of death, it will appear that none of these causes would be enhanced by the peculiarities of the present case, and the additional operation. The chance of irritation in the trachea, œsophagus, &c. producing cough, and destroying adhesion in the vessel, or in the par vagum, disordering the stomach, was equal in either case, but the danger most to be apprehended from hæmorrhage was less considerable than in aneurism, from the artery being almost certainly healthy. If inflammatory symptoms supervened, they were also likely to be relieved by the discharge of a large suppurating sore; and the loss of blood during the operation, though considerable, would be in this respect advantageous and desirable.

Another consideration was the power of restoration, for the skin covering the tumor was diseased; a large suppurating surface must therefore be exposed and filled by granulations. It was not certain that sufficient power would remain in the part for these operations, especially as the sources from whence they must proceed, were previously weakened by disease. But having expressed my willingness to encounter these difficulties, the woman was importunate for the attempt; and as an alarming hæmorrhage supervened on the third day after my visit, her life could not be materially shortened, and no time ought to be lost. I, therefore, with the consent of Mr. Killer, who had obligingly offered me his assistance, appointed Tuesday, September the 5th, to meet my friends at Middleton, for that purpose. I was disappointed in not having Mr. Killer's valuable assistance, but his place was kindly supplied by my ingenious friend Mr. Jordan, of Manchester, who with accurate anatomical knowledge combines great coolness and dexterity; and in the presence of Messrs. Brigham, Woodcock, Morris, Bingham, and several other gentlemen, the operation was performed in the following manner: the pa-

tient being previously laid upon a table, with her head as low as she could bear, from the danger of suffocation by the pressure of the tumor.

An incision about four inches in length was made through the integuments, and the tumor at the same time brought as much as possible from over the trachea, to reach the edge of the sterno-mastoid muscle; the course of which could not previously be traced, the sternal edge of its tendinous insertion being only just perceptible; blood followed the incision very profusely, but having dissected the sac of the tumor from the neighbouring integument, the inner edge of the muscle came into view, and the platisma myoides being more freely divided, the artery was plainly felt beating at the bottom of the wound. The knife was now laid aside, the cellular membrane separated by the fingers, the arterial sheath exposed, and the vessels secured between the finger and thumb: I endeavoured to separate the fibres of the fascia by the nails of the fore-finger and thumb, so as to pass the finger beneath the artery, and by its constant apposition with the vessel, prevent any other part from being included. The resistance to this attempt was great, and the eyed end of a probe which I had formerly found useful was directed to the outside of the vessel, so as to press against the finger on the opposite side; but though bent at different angles to accommodate it to the wound the shaft of the strongest probe was too slender to be directed with accuracy to so great a depth, and generally turned in the wound. The size of the tumor very much added to the difficulties of this stage of the operation, not only by rendering the wound deeper, but as it was necessary to keep it aside, and this necessarily impeded the fingers; whilst, if left at liberty, by pressing upon the probe, it changed its direction. The point of an aneurismal needle was next tried with no better success, but on directing the shaft of the needle into the wound, it was pressed against the finger with great facility; and when convinced that no part intervened, for the vessel had been stripped of its fascia, except at its posterior part, where, on insinuating it between the thumb and finger, passed on each side, only a few fibres were left undivided, and the division of these being accomplished, the finger was gradually and cautiously

passed under the vessel, with the needle in contact with it, passed from without inwards. But it had to be turned, which in so deep a wound was with difficulty accomplished; and though the greatest care was observed by keeping the finger of the left hand between the end of the instrument and the trachea, and pressing at the extremities of the instrument to bend and accommodate it to the cavity, more violence was done to the vessel than was desirable.

The patient bore this tedious operation with great fortitude, only endeavouring to relieve the irritation which the fingers produced, by a frequent attempt to swallow. A considerable quantity of blood was already lost, and the ligature was therefore immediately tied as low as possible in the wound. She complained of much pain, when the thread was drawn tight, extending from the wound to the whole of that side of the head.

The fluid contained in the apex of each tubercle was next discharged to reduce the size of the tumor, and render it more easily handled, as well as to lessen the pressure on the trachea, of which the patient complained heavily. The incision being then carried along the base of the tumor to its upper part, it was dissected from the cheek; though, during this and the remaining part of the operation, the fingers were used wherever practicable: but occasionally stronger ligamentous bands rendered division by the knife necessary. The hæmorrhage, on dividing the integument, which connected the upper portion of the tumor to the head, where the external veins were ramified over it, was considerable, and on dissecting downwards, the ramus of the jaw became cognizable; and in this part, as well as under and behind the ear, each stroke of the knife was followed by a gush of blood, and occasionally in a tremendous stream, which after continuing for a few seconds, ceased. The patient was very faint when the operation was finished, but a little wine at intervals soon restored her to complete perception.

Besides a general oozing there were a few points from which blood flowed rather freely, though the blood was venous; and as a matter of caution rather than of necessity, they were secured by ligature. The wound now exhibited the fol-

lowing appearances: the whole sterno-mastoid muscle was exposed, and its fibres dissected clean, except about half an inch from its insertion into the clavicle. The wound extended backwards from behind the mastoid process, to the trachea anteriorly, but became narrowed in the direction of the muscle at the lower part of the neck. The submaxillary gland was exposed, and about one fifth of its substance, not appearing healthy, was removed. The digastric and the greater portion of the milo-hyoideus were exposed, the ramus of the jaw was only covered by periosteum, except where covered by the masseter muscle, part of which, not appearing healthy, was dissected away; the whole of the condyloid process of that bone was laid bare in the same manner, and behind it the pterygoid muscles were also exposed. The membrane of the cheek was only covered by a cellular substance, which did not appear healthy; but sufficient skin was saved to cover the zygoma. The parotid gland was entirely removed.

After cleansing the wound, the skin wrapped over as much as possible, was secured by adhesive plaster, covered with a pledget of lint spread with cerate. The patient expressed herself comfortable, though very faint; and the table being brought to the bed-side, she was lifted into it. Her pulse was 110 and very weak.

11 *p. m.* She is very comfortable, except from thirst, and soreness in the throat, which impedes swallowing. Her pulse is risen, though not less frequent. She has made water freely.

Wednesday, 9 *a. m.* (second day.) She was troubled with thirst till midnight, but afterwards slept comfortably; the soreness in the throat is abated, though on swallowing it is perceptible. At 4 *a. m.* she perspired copiously, and her skin is now moist. Pulse 108 and soft: she has passed urine freely; no discharge from the bowels, but she had three motions yesterday previous to the operation. There is a copious secretion of tough mucus from the trachea, no headache or sickness, and the wound is easy. A general oozing of blood has stained the dressings.

9 *p. m.* Pulse 120, skin rather hot and dry; occasional pulsation in the head; no thirst. Discharge of bloody serum from

the wound continues. To have an opiate if restless; and an enema early in the morning if the bowels have not been opened.

Thursday, 9 *a. m.* (third day.) The patient has had a good night without the opiate, having scarcely awoke. Her pulse is now 106 and soft, no pain in the wound, though the face is somewhat swollen. She had a shivering in the night, which was immediately removed by a warm covering, but succeeded by considerable heat.

In addition to the soreness of the throat, she has a trifling cough, which gives no pain. The enema procured three large motions of a good colour and consistence; she makes water freely; and has taken tea and gruel comfortably, but in small quantities.

9 *p. m.* The pulse is again risen to 120 and full. She complains also of some headache, and the throbbing extends down the face; her bowels have not been again moved. She has neither thirst nor heat. The oozing of blood appears to have ceased, and the soreness in the œsophagus and secretion of mucus are somewhat moderated. Her head and neck have been kept moist with tepid water, and she is directed to take one of the following powders every four hours.

R. Hydrarg: submuriat: gr. vj.

Pulveris Antimonial: gr. xvj. M. et divide in chart: vj.

Friday, 9 *a. m.* (fourth day.) I found her with her skin cool and moist, pulse 100 and soft. She passed the night comfortably, the beating in her head is less troublesome, and is perhaps of little consequence, as she is subject to it. The wound discharges copiously, which will relieve any determination to the head. Her bowels have been again opened this morning. She has still a tenderness on swallowing, and a considerable flow of mucus; but her cough, which has been very trifling, has left her.

Friday evening, 8 *p. m.* Pulse 104, but possesses a peculiar vibrating feel, her head is easy, she has no heat, little thirst, and is without cough. The mucous secretion does not increase, though the soreness is extended to the root of the tongue. The catamenia, which had begun to flow this morning, have ceased. Her bowels have been again opened. If the headache return, or the soreness in the throat increase, let an

enema be injected. To continue her powders, and to take milk freely.

Saturday, 9 *a. m.* (fifth day.) Pulse 104 and soft; there is neither thirst nor headache complained of; the skin is cool.

The pain on deglutition, and the ptyalism as usual; but the former is complained of chiefly after sleep. The night was passed comfortably.

The dressings were removed, and the following appearances were noted down. The wound is very extensive, and covered in its upper portion with a dark coloured mucous matter, which adheres to it. There is also some dark coloured coagulated blood oozing from several points. The lower half of the wound is not at all granulating, but of a palish ash colour, and the skin in some parts of its edge vesicatory. The discharge is considerable and watery.

Dry lint was applied, and the patient was ordered to take wine or porter in small quantities, in addition to her milk and broth.

R. Decoct: cinchonæ lancif: f. ℥vij.
Tinct: cinch. Comp: f. ℥ss.
Acid: Sulph: dilut: f. ℥j.
Tinct: Opii *m* xl. M. Capiat cochl. ij quartâ quâque horâ.

Vespere.—Skin cool, pulse 100. She has taken broth, milk, &c. and a small quantity of wine; but the pulse having risen it has been omitted. The bowels have not been moved since this morning's visit; a purging powder was therefore given, and the bark and wine discontinued till the bowels were opened.

Sunday, 10 *a. m.* (sixth day.) Pulse 98 and soft, the skin cool, no headache or thirst, and the difficulty in swallowing abated. About three o'clock she awoke from a dream, and was much agitated; her pulse was then very quick, and the throbbing in the head very violent, with acute pain; but in half an hour she again slept, and passed the remainder of the night comfortably. There is some sensation in the cheek, and the warmth has been always natural. Her bowels have not been opened.

The upper surface of the wound is sloughy, the lower part

granulating, but the granulations are very pale. A slough also lines the orifice, which passes to the artery.

Monday, 10 *a. m.* (seventh day.) The patient has passed a good night, the pulse is 100 and soft, and she is free from thirst or fever. Her appetite is good, and she takes plentifully of milk, pottage, and broth. A motion was yesterday procured by an enema, she had another this morning. The secretion of mucus and the pain on swallowing are abated. There is some deficiency of saliva, the mouth being generally dry after sleeping. The discharge is partly puriform, but there is a very copious flow of saliva from the submaxillary gland. The slough is thinner, having here and there points of granulation rising through it, in one place the size of a sixpence. In the neck the granulations are pale, but there is a disposition to cicatrize on the posterior edge, where the mastoid muscle passes. The pulsation in the right carotid extends to the left side, and that of the left subclavian seems to be communicated to the vessel which has been tied, and excites suspicions of its being still pervious.

Tuesday, 9 *a. m.* (eighth day.) The sloughs continue to separate, and the granulating surface is less pale. The discharge is copious, and from the neck puriform. There is also some discharge from the orifice through which the ligature passes to the artery, but it is very healthy, and the slough lining it has separated. The last ligature on the small vessels also came away this morning. The patient passed a good night, and her strength increases.

Wednesday. She was restless till one *a. m.* but her bowels were then moved, and she afterwards slept comfortably, yet is not so well this morning. Her pulse 110 and irritable. Her appetite fails, having a dislike to any thing but gruel; yet her tongue is clean, her skin moist, her bowels have been again opened, and the discharge is natural. She had yesterday some throbbing near the ligature, but to-day the wound is easy. The ulcer on the neck contracts rapidly, the granulations, though pale, being healthy; but in the upper part, covering the cheek, the surface is glassy and irritable, with streaks of vessels running over it. The sloughs are mostly separated, except one, the size of a shilling, below the ear; and another in the deepest

part of the wound, at the lower edge of the submaxillary gland. The flow of saliva from this part is very great; below it, the discharge is healthy, but upon the cheek glutinous. A very little healthy pus may be pressed out of the orifice through which the ligature passes, but the granulations are rapidly closing around it, and it is now a mere fistulous opening. Dry lint was applied to absorb the moisture, and over it adhesive plasters.

I visited her again this evening, and found her pulse 104 and softer. The perspirations have been considerable, and the bowels again moved naturally. She was directed to eat ripe fruit, and omit the wine.

Thursday (the tenth day.) The following report was collected at this morning's visit. The patient passed a good night, —her appetite is returned, and her pulse early this morning 94. The wound looks much better, and contracts rapidly; the upper portion beginning to heal, particularly near the ear.

Friday. Much as yesterday, in all respects going on well. The pulse 102. She has been allowed to sit up, the last three days takes food well, her bowels regular and the discharge puriform. The ligature has risen considerably out of the wound.

Saturday (eleventh day.) The ligature came away this morning, without the smallest hæmorrhage; her pulse is 92 and soft. She slept well after midnight; her appetite is excellent, bowels regular, and the wound healing rapidly.

Sunday (twelfth day.) Much as yesterday, pulse 92. She sat up an hour yesterday without fatigue, and slept well.

Tuesday (fourteenth day.) The pulse yesterday morning, in consequence of being agitated, 108 and irregular; to-day it is only 82, soft and regular. The patient improves progressively, but the granulations rise above the surface, and there has been a large secretion of saliva: the surface was therefore occasionally washed with a solution of the nitrate of silver, which has repressed both these inconveniences. The wound leading to the artery is entirely filled up. The general health is good, and on the seventeenth day after the operation she sat up three hours without fatigue.

It is unnecessary to occupy the time of the society by a fur-

ther detail of her advancement towards a complete recovery. In ten weeks the wound was healed; but the granulations were never florid or pointed, and the secretion of saliva was long considerable, though it did not appear to retard the cicatrization of the ulcer. There has been no symptom of a return of this formidable tumor.

I cannot close my account without calling the attention of the society to the improvement which this branch of surgery is likely to derive from this operation, for the extirpation of any tumor behind the jaw, which is not connected deeper than the muscles attached to the styloid process, may with safety be removed by it, and very few instances of disease here have a deeper origin. The surgeon cannot however be too cautious, that neither the larynx nor pharynx are attached to it.

I know of no case, where the disease was at all comparable in extent, with a similar result. The rapidity of the growth of the tumor shows its extreme vascularity, and the flow of blood was so considerable, even with the carotid tied, as to convince me, if the subject had previously admitted of a doubt, that the most dextrous operator could not have completed it without that preparatory step.* It was not merely the security which was thus afforded to the operator, but the chance of the tumor being reproduced was also lessened; for if any portion of the diseased structure escaped observation, by cutting off so directly the flow of blood, there was great reason to conclude it would die from mere exposure. I hailed the sloughing surface, therefore, as a favourable circumstance, whilst it did not extend too deep; for there could be no hesitation in attributing it to the right cause, as the constitutional symptoms were mild. The vesicatory tendency in the skin along the edges of the wound, though partial, in all likelihood depended on some portion being left to cover the wound, which had been previously weakened by disease, and shows that the parts must be healthy to recover from so direct a privation. The sphacela-

* In a similar case, especially if the tumor were well defined, the operation would be much simplified, if, instead of tying the artery, the surgeon were to cut down upon, and command the current of blood through it, by an assistant pressing it either upon the vertebræ, or between his finger and thumb, until the tumor were removed, and the divided branches secured.

tion of the skin over aneurismal tumors, after the operation, is no doubt owing to the same cause.

A question would arise from this view, as to the propriety of merely performing the preparatory operation, and leaving the diseased mass to slough away. But it appears to me unadviseable, since the sloughing of so large a substance would produce more constitutional derangement than its removal by the knife, and retard, if it would not prevent, the adhesion of the arterial coats.

I do not dwell on the additional confidence which is now afforded, in tying the principal blood vessels, where there has been no obstruction to the circulation; for though a point of much practical importance, there is already a thorough conviction of its necessity and propriety; and for this conviction we are indebted to Mr. Abernethy, and other surgeons of the present day.

But these operations, always delicate, may be much facilitated by improvement in the instruments with which they are performed. The great variety used, shows that none of them are well calculated for accomplishing the principal objects of the operation. For if strong enough to be directed and passed under the vessel, the instrument has to be turned in the wound, and the property which rendered it valuable in the first stage of the operation, becomes now a great disadvantage. I am happy to present an instrument invented by Mr. Jordan, possessing both these properties, by a contrivance which displays great ingenuity. The following is an extract from Mr. Jordan's letter, explanatory of it; which, with a needle on his principle, I beg leave to submit to this society.

"When an aneurismal needle is passed under an artery and turned in the wound, the length of the needle is the diameter of a circle, a segment of which must be formed, or the parts forced from their natural position; and although the diameter may be diminished by increasing the curve of the instrument, to do this with the common aneurismal needle, requires more force than it is desirable to use. When the instrument is passed under the vessel, its shaft is worse than useless, but if we could convert the shaft into an elastic substance, its flexibility

would render the turning of the instrument easy; with this view I have formed the inclosed needle.

"Cut off about five-sixths of the shaft of a common aneurismal needle, and to the curved portion join a piece of elastic steel of a convenient length, in the upper part of which is an eye for the passage of the ligature. To give this the necessary firmness, I have a small silver sheath, which slides upon the steel and covers it, except at the superior part where the eye is formed. This sheath opens laterally, and may be taken off when the firmness of the needle is no longer necessary."

A Case of Incontinence of Urine, of nine years duration, cured by External Pressure. By John Hyslop, Esq.

[From the Medico-Chirurgical Transactions, Vol. VI.]

The patient was a young gentleman of 13 years of age, who had been subject to incontinence of urine for nine years, during which time he never passed a single day, without several involuntary discharges of his urine, and even during the night the same unfortunate and involuntary evacuation constantly took place.

In consequence of this, his life became truly uncomfortable. He had to submit to pain from inflammation coming on in the neighbouring parts, and from consequent excoriations; and he suffered much from the disagreeable urinary effluvia which constantly passed by evaporation from his clothes and from his bed.

But that was not all the evil which arose from this distressing state. He had to bear up in his mind under shame and vexation; the trying to hide what could not be concealed, gave him unavailing anxiety; and the sneers of his play-fellows and of servants, were, he has often told me, almost insupportable. He was even refused admittance into boarding-schools; and a shyness of manners, with a wish for solitude and retirement, gradually came on, and most likely had entirely changed, or greatly subdued the energy of his mind.

Many physicians and surgeons had been consulted, and various were the means employed. Tonics, cold bathing, blisters, at one time to the sacrum, and at another to the perinæum, had been applied, and opiates, with a view to break in upon a habit which by degrees had become established, were fairly and freely tried, but without any success.

He was sent to London to be under my care, and as I could have him in my house, so as to be constantly near him, I determined to employ pressure. The jugum penis did not answer the purpose, because it strangulated the glans so much that it could not be endured for the necessary length of time. I was therefore obliged to have recourse to some invention of my own, and it consisted of the following simple apparatus.

I selected a bougie of a size large enough to fill his urethra, from which I cut about two and a half, or three inches. Having placed that on the outside of the under part of the penis on a line parallel to the canal, with its point projecting a short way beyond the glans to avoid as much as possible any pain from pressure, I passed straps of adhesive plaster around, (first at the point of the penis, and afterwards continuing strap after strap the length of the piece of bougie,) and pulled them so tight as to press the bougie close in upon the urethra, so that no space was left by which urine could pass.

This was done at ten o'clock at night, and at three o'clock he called me out of bed, having a great desire to pass urine. I removed the straps, &c. and when he had emptied his bladder, I applied others in the same manner. The next desire for this evacuation was about seven o'clock, and the next again at eleven o'clock in the forenoon. After each evacuation the pressure was renewed without any unpleasant symptom, and in three days he was cured of incontinence of urine.

How far such treatment might answer the purpose of cleanliness and convenience, in paralysis, I have as yet had no experience, but when a case of that kind comes under my care, I shall not hesitate in giving it a trial.

A Case of Aneurism by Anastomosis in the Left Orbit, cured by Tying the common Trunk of the left Carotid Artery. By William Dalrymple, Surgeon to the Norfolk and Norwich Hospital, and to the Norfolk Lunatic Asylum.

[From the Medico-Chirurgical Transactions, Vol. VI.]

On the 24th of November, 1812, Dinah Field, aged 44 years, of a delicate and sickly habit of body, came to me with a complaint in the left eye. She said that about five months since, being then pregnant of her sixth child, she was seized in the middle of the night ,with an intense pain in the left eyeball, accompanied by a whizzing noise in her head, which grievously distressed her. "The attack was sudden, instantaneous." That, "hearing a noise as of the cracking of a whip, and feeling at the same moment an extraordinary kind of pain in the globe of the left eye, she awoke in great alarm, and leaped out of bed." About ten or twelve hours afterwards the eye became inflamed, and the eyelids so much swelled, as to project considerably beyond the level of the upper and lower orbitary ridges. She also felt acute pain over the whole of the left side of the head; and in the left eyebrow, and at the bottom of the orbit, her anguish was scarcely to be borne. In the succeeding night the extreme violence of the pain abated, but the swelling of the eyelids seemed rather to increase; and she thought she felt as if "the globe of the eye was forcibly driven upwards towards her forehead." No particular alteration took place in the next seven weeks, at the end of which she was delivered.

During her labour, which she said was very severe, there was projected between the eyelids a bright red tumor of an oblong form, which for seven or eight days gradually enlarged, until it occupied, in a vertical direction, almost the whole space between the superciliary ridge and the lower edge of the ala nasi; reaching horizontally from the external angle of the left eye, across the root of the nose, to nearly the internal canthus of the right eye. In the course of her confinement, this tumor was punctured in several places by a surgeon who then

attended her. It bled freely, became smaller, and of "a strikingly darker colour." A week afterwards it was again punctured, and with similar results; and although the operation was repeated four other times, the latter incisions afforded no relief.

About two months previous to the appearance of this swelling, the patient lost all power over the levator muscle of the superior palpebra: but if the swelling was depressed and the upper eyelid raised, she said she could see as well as ever. She soon afterwards became totally blind on this side.

Such was her case, and such her appearance, when I first saw her on the 24th of November. She was then only a week under my care, and ceased to be so from the end of November till the middle of March, a period of three or four months. When she again became my patient her general health had sensibly declined; and her condition was very wretched. The local affection was also marked by very decided characters. It was distinctly ANEURISMAL. Her pain was constant and acute, and chiefly referred to the bottom of the orbit; but her severest suffering was occasioned by an unceasing noise in her head, which she compared to the "rippling of water," and said "that it became absolutely insupportable whenever by any accident her head fell below a certain level."

The left eyeball was immoveable; and either enlarged, or thrust with so much force against the upper eyelid, as to cause this part to project in a convex form, considerably beyond the superciliary and infra-orbitary ridges. The eyebrow also of the affected side rose somewhat above the range of that of the opposite side. The external surface of the tumid eyelid was for the most part soft and elastic to the touch, but its cuticle was remarkably coarse, as was, indeed, the texture of the skin generally in the vicinity of the orbit. Deep seated between the integuments of the eyelid, a little towards the inner canthus of the eye, there was a cluster of small tumors of a firm and dense structure, causing great pain when compressed, and communicating to the finger a pulsatory thrill. Interposed between this cluster and the lower edge of the eyebrow, precisely in the course of the frontal branch of the ophthalmic artery, there was a hard tubercular substance, which rose somewhat

higher above the general surface of the eyelid, and pulsated still more distinctly than the smaller swellings. The texture of this substance was particularly hard and compact, the slightest pressure upon it occasioned intolerable pain. The lower eyelid was averted, and formed a bright red convex tumor, following, in its outline, the direction of the inferior edge of the orbit, and reaching from the external commissure of the eyelids a little way beyond the tendon of the orbicularis muscle. At its upper part it was covered by an overlapping of the upper eyelid, which was paralytic, and entirely concealed the globe of the eye. The most depending point of this tumor reached to within a line of the sub-orbiter foramen. Like the tumors at the upper part of the orbit, this swelling communicated to the touch an aneurismal thrill, which also became evident to the sight whenever the force of the circulation was increased. In addition to these appearances, immediately above the nasal third part of the superciliary ridge, the integuments were gently elevated into a soft ill defined tumor, occupying very exactly the situation of certain branches of the frontal artery, and pulsating simultaneously with the artery at the wrist. A similar elevation of the skin was perceptible at the root of the nose, giving a faint tremulous motion to a finger placed upon it. When the globe of the eye was uncovered, it appeared, at first, to be enlarged, but a closer inspection showed it to be forcibly thrust forwards, in a direction somewhat outwards and upwards towards the root of the orbit. A multitude of enlarged vessels might be traced from the surface of the lower tumor to that portion of the conjunctiva which covers the sclerotic coat of the eye. The cornea retained its natural lustre and transparency, but there was a total loss of power in the fibres of the iris; and the pupil, which was much dilated, had a slightly irregular figure. Behind the lens a fawn-coloured appearance was observed, similar to that which is represented in the second plate of the posthumous work of that admirable observer, Mr. Saunders. The cutaneous veins of the face generally were very full of blood, and gave to the skin of the whole of this side of the face, the complexion of a person strangled. When strong pressure was made upon the common carotid artery, the tremulous motions of the tumor situated at

the lower part of the orbit ceased entirely, but the pulsations of the upper swellings continued in some degree. The force of the stroke was, indeed, much weakened, but no pressure which the patient was able to bear could entirely suppress it.

Such is the exact description of this interesting case when it came a second time under my examination, and I could not fail to perceive in it the characters of that particular affection of arteries which, with perhaps a doubtful propriety, has been called "Aneurism by Anastomosis," as well as the closest resemblance to the case, which, with a master hand, has been described by Mr. Travers in the second volume of Medico Chirurgical Transactions.*

At noon, therefore, on the 7th of April, 1813, I tied the common trunk of the left carotid artery, in the presence of Dr. Wright, the late Dr. Reeve, Mr. Stevenson, and some other gentlemen.

The operation was performed after the manner adopted by Mr. Astley Cooper, in the case of Humphrey Humphreys, with a single deviation;† and its course was marked by the same circumstances which attended the operation of my distinguished friend. As soon as the margin of the mastoid muscle was raised, the descending nerve of the ninth pair was exposed to view, and when the sheath of the artery was laid open, the par vagum was seen at the outer side of the vessel. The jugular vein, pushed by the fore-finger of the left hand beneath the edge of the mastoid muscle, afforded no embarrassment. Nothing but the bare artery was included between the ligatures, which were formed of a small, but very strong *round* twine, and placed at the distance of about an inch and a quarter from each other. They were tied very firmly around the trunk of the artery, which was divided in the interspace, at the distance of about two thirds of an inch from the lower

* It would be difficult for me to over-state the assistance which I derived, in this case, from the excellent paper above mentioned: and I eagerly embrace this opportunity of acknowledging an obligation, the value of which can be appreciated only by those who may have been placed in situations of similar responsibility.

† This deviation consisted in omitting to pass the needle and thread through the artery, above one ligature and below the other.

thread. The edges of the wound were brought together by the common adhesive strapping; and the end of one of the ligatures was marked for the sake of subsequent observation.

The effects of the operation were immediate and decisive, As soon as the ligatures were tied, the pulsatory motions of the tumors on the forehead and cheek entirely ceased; but a slight thrilling was still perceptible in the tumid upper eyelid. The red swelling of the lower eyelid became paler, and its surface shrivelled. A few minutes after the patient was placed in bed, she was quite free from pain, and the noise by which she had been so long tormented having now also ceased, she declared to Mr. Stevenson, that "her head no longer felt like her old head."

At 5, *p. m.* there was no pulsation in any of the tumors. She had suffered a good deal of heavy pain at the hinder part of the head, but that had subsided, and she was calm and clear. —Pulse 102.

9, *p. m.* Some stiffness and difficulty in the act of swallowing, with restlessness and anxiety.—Pulse 104.

8th April, 7 *a. m.* Had passed a tranquil night, though with very little sleep.—Pulse 100 and soft.

1, *p. m.* Calm and easy, intellect perfectly clear. The upper eyelid, for the first time during several months, was moveable.

9th April, 7 *a. m.* Had passed a good night with much refreshing sleep. Pulse 100 and soft. The tumor over the inner part of the eyebrow entirely gone. The swelling of the upper eyelid was much smaller, its texture much softer, and it was less painful when compressed. The globe of the eye was also considerably retired within its orbit. At the wound all was quiet, but there was much difficulty in swallowing.

10 *p. m.* Had passed a tranquil day, and was very cheerful.

10th April, 7 *a. m.* An excellent night.—Pulse 98.

1 *p. m.* Bowels relieved.—Pulse 96.

11th and 12th April. Two excellent days and nights.—Pulse 84 and 80.

13th April, 10 *a. m.* Had passed an indifferent night, and was very unwell. The first dressings removed. The edges of the wound had united throughout their whole extent, except the extreme points where the ligatures were placed.

2 *p. m.* Two hours ago had a smart rigor, and was now become hot and thirsty.

9 *p. m.* Fever fit subsided.—Pulse 90 and soft.

14th April, 6 *a. m.* An easy night, with much refreshing sleep.

2 *p. m.* She was very unwell, complaining much, with a good deal of general commotion in the system.—Pulse 112 and hard. Sixteen ounces of blood were taken from the arm, and a purging mixture ordered.

5 *p. m.* Had been purged twice, and was now cool and easy. —Pulse 90, soft and flowing.

15th April, 8 *a. m.* Quite at ease. Great changes have taken place in the tumors. The globe of the eye was completely retired within its orbit, and the general prominence of the upper eyelid had sunk proportionably. Not the slightest pulsatory or thrilling motions were perceptible in any of the diseased parts.

15th, 16th, and 17th of April. Prosperous days. On the last day the patient got out of bed, for the first time.

18th April. The upper ligature came away upon the dressings this morning, being the eleventh since the operation.

From the 21st of April to the 3d of May, daily improving in health and strength.

4th May. During the last three or four days, the lower ligature had been gradually rising to the surface, and to-day it came away, followed by a large discharge, but unaccompanied by the slough of the artery.

7th May. Within the last two days loose luxuriant granulations had arisen at the extremities of the wound where the ligatures were inserted. These were treated with the nitrate of silver, but their growth was restrained with difficulty; and the quantity of matter was too large.

10th May. A smart fever fit to day, with pain and tension, and redness of the skin along the edges of the cicatrix.

12th May. A sinus had formed, and a considerable discharge of pus took place at the lower opening.

17th May. The loose spongy granulations having subsided, and the wound being nearly healed, the patient was this morning allowed to return to her family. From this period to the

3d of July, nothing material occurred. The tumors had all disappeared, and the patient's general health seemed re-established; yet the wound was not entirely closed. Pale, flabby granulations daily arose at the points where the ligatures were placed on the artery, and several small sinuses, forming in slow succession, occasioned much trouble. At length, on the evening of the 3d of July, I was called in great haste, in consequence of a bleeding which had taken place at the lower part of the wound. I went instantly; but the hæmorrhage had ceased before I could reach the house. The colour of the blood was florid, the quantity lost computed at ten or twelve ounces. This accident distressed me greatly, and produced so much commotion in the system of my poor patient, that the spongy substance which surrounded the little opening whence the blood had flowed, was forcibly propelled from the wound by every stroke of the heart.

A similar discharge took place on the evening of the 9th of July, which, like the former, ceased spontaneously; and happily proved the last of a series of incidents not unlikely to disappoint the hopes which the earlier circumstances of the case had inspired. From this period, however, the course of events was prosperous; and on the 19th of July, which, reckoning from the morning of the operation, comprises a period of 103 days, the wound was firmly healed, and the patient's recovery secured. Of her present state it only remains for me to observe, that, after a lapse of nearly two years, her cure appears complete, with the exception of her sight, which seems irrecoverably lost. Nor can I, at this period, entertain a fear of a recurrence of the disease, notwithstanding the apprehensions which, in reference to cases of this kind, have been felt and expressed by a great master of our art.

With respect to the state of the local circulation, as far as it can be known, there is no pulsation to be felt in any of the branches of the temporal and facial arteries on the side on which the ligature was tied. But, as in the case treated by Mr. Travers, "the artery may be distinguished beating very feebly below the angle of the jaw;" and a very brisk action of collateral branches, lying near the surface, is visible in the vicinity, and along the course of the cicatrix.

SELECTED REVIEWS.

Traité des Poisons, tirés des Règnes minéral, végétal, et animal; ou, Toxicologie générale considérée sous les Rapports de la Physiologie, de la Pathologie, et de la Médicine legale. Par M. P. Orfila, Naturaliste Pensionnaire d'Espagne, Docteur en Medicine de la Faculté de Paris, Professeur de Chimie et de Physique; précédé du Rapport fait à la Classe des Sciences physiques et mathématiques de l'Institut de France.*

[From the Annals of Medicine and Surgery, for June, 1816.]

We are anxious to give a connected view of the contents of this interesting work, which is now completed, and will be shortly translated into our own language.

The author in his preface, after descanting in no ordinary terms upon the importance of his subject, proceeds to state, that a general treatise on Toxicology, on a level with the present state of our knowledge, was altogether wanting to science. The truth of this remark cannot be denied, and the profession, as well as the public in general, are certainly much indebted to him for undertaking the laborious task of supplying this deficiency, which, by means of a zeal and perseverance seldom equalled, he has executed in a manner that reflects no inconsiderable honour upon himself. For if he has not completely succeeded, his failure must be attributed to the nature of his subject, and he has the merit at least of having approached perfection much more nearly than any of his predecessors.

M. Orfila defines a poison to be "a substance which taken

* The Eclectic Repertory for January 1816, contained a concise analysis of the first part of Orfila's Toxicology. We publish, however, in this number, a full and connected review of the whole work, as we are anxious to disseminate all the information that we can acquire on this interesting subject.

Editors.

inwardly *in a very small dose*, or applied in any kind of manner to the living body, depraves the health or entirely destroys life." This definition is perhaps exceptionable. The *quantity* of a substance requisite to act as a poison, it is obvious cannot be stated so as to be universally applicable, and had therefore better been left out of the definition. Our author seems to have been sensible of the imperfections of Fodéré's arrangement of poisonous substances,* which, with some slight variations, he has adopted. This arrangement is indeed very defective, though it is not perhaps possible, in the present state of our knowledge, to form upon similar principles a much better one, and certainly not one that shall be free from every objection. For our own parts, we prefer an artificial classification, founded upon external and obvious characters, to a pretended scientific one, founded often upon imaginary and hypothetical properties, which by assuming the appearance of instruction, too often misleads us; and it is in conformity with this *unphilosophical* taste of ours, that we should have rather chosen the old classification of poisonous substances into the mineral, vegetable and animal, with appropriate subdivisions, than that adopted by M. Orfila, in which they are attempted to be arranged into six classes, according to their supposed modes of operation, viz. 1. *Corrosive, or escharotic* poisons. 2. *Astringent* poisons. 3. *Acrid* poisons. 4. *Stupefying*, or *narcotic* poisons. 5. *Narcotico-acrid* poisons, and 6. *Septic*, or *putrefying* poisons. But as this arrangement did not originate with our author, perhaps it would be unfair to criticise it further, we shall therefore only observe, that in consequence of its imperfections, his general remarks upon each class are extremely defective. In treating however, of *particular* poisons, he has been much more successful. He first presents us with a minute and accurate account of the physical and chemical properties of the different poisonous substances, in which he not only states their action upon various re-agents, but also the effects they produce upon many of the constituent principles of the human body, and upon different articles used as food. He offers likewise many interesting and important examples of the

* See Traité de Médicine Légale par F. E. Fodéré, Tom. IV.

modes in which the action of tests upon poisons is modified when they are mixed with organized substances, and thus shows how cautious we ought to be in giving opinions from mere chemical evidences, when the poison is operated upon, as it frequently must be, in conjunction with the contents of the stomach, &c. We consider this in general as a valuable part of M. Orfila's work, and regret that he had not pursued this part of his subject further. The action of poisons upon the animal economy, when taken into the stomach, applied externally, or injected into the veins, is the next object of our author's enquiry, and under this head are related a great number of original and interesting experiments. We cannot, however, help thinking, that the modes of conducting many of these experiments were very exceptionable; thus, to prevent the substance being ejected by vomiting, the œsophagus was tied—an operation which alone, as M. Orfila himself confesses, generally proved fatal. Very little also can be learned of the real poisonous nature of a substance, by introducing it at once into the sanguiferous system, as the mildest and most innocent substance will generally prove fatal under these circumstances, whilst substances that act chemically upon the blood, from this very property alone, will speedily destroy life. These circumstances induce us to doubt the perfect legitimacy of some of our author's conclusions, as we shall note more particularly when we come to speak of the poisonous substances individually. Our author next proceeds to mention the nature of the symptoms produced by poisons, both as deduced from his own experiments detailed in the preceding sections, as well as from cases related by others; and to this account succeeds another, illustrating their destructive action upon the organization. The next point of view in which M. Orfila considers his subject, is a very important one, namely, the application of all the preceding facts to cases that may occur in juridical practice. These cases he considers as of four descriptions—first, the person may be living, and the remainder of the poison can be procured; secondly, the person may be living, but none of the poisonous substance, save what is voided by vomiting or stool, can be procured; thirdly, the person may be living, but no opportunity may be afforded of procuring any of the poison; and

fourthly, the person may be dead. In each of these cases, he describes the line of conduct to be adopted, and when it is possible, the best and most certain modes of detecting the nature of the poisonous substance. Lastly, he gives us the mode of treatment to be adopted in cases of poisoning by the different substances of which he treats, in which he points out the most effectual methods known of counteracting their deleterious effects, and concludes by an enquiry into the efficacy of their supposed antidotes.

After these general remarks, we come to consider the subject more in detail, and in doing this shall follow the arrangement adopted by our author.

Class I. *Corrosive* or *escharotic* poisons. Under this head are included the preparations of *Mercury*, *Arsenic*, *Antimony*, *Copper*, *Tin*, *Zinc*, *Silver*, *Gold*, *and Bismuth;* also the concentrated *Acids*, the *Caustic Alkalies*, and *Alkaline Earths*, *Glass*, and *Enamel* in powder, and lastly, *Cantharides*.

Mercurial poisons. Of these the most important is the corrosive sublimate or oxymuriate of mercury, on which our author therefore has very judiciously bestowed the greatest attention. The characteristic properties of this salt are, its solubility in water, alcohol, and ether; its being precipitated from its solution in water by carbonate of potash, of a deep brick-red colour; by pure potash, of a yellowish red colour, except when much diluted, when the precipitate is white; by lime water, in a moderate quantity, of a deepish yellow colour; by ammonia, white; by the hydrosulphurets, black; by the nitrate of silver, white, becoming black on exposure to light; by the triple prussiate of potash, white; by the hydriodate of potash (not mentioned by M. Orfila,) of a beautiful scarlet; by metallic mercury, white, &c. Heated with potash, it yields metallic mercury, as do likewise most of the above precipitates, on being heated with charcoal. By many vegetable substances, as gums, extracts, &c. this salt is converted into submuriate of mercury, or calomel, which is precipitated in union with a portion of the vegetable matter. The same is also true of many animal substances, as albumen, of the presence of which it is a very delicate test; likewise of some varieties of the ill-defined principle called *osmazome* by

the French chemists: also of bile, milk, broths from the gelatine they contain, &c.; it has moreover the property of corrugating and hardening fibrin. M. Orfila gives the *rationale* of all these phenomena as he proceeds, and afterwards points out some of the modes in which they are varied, when the poison is mixed with different substances; as for example, when this salt is mixed with Burgundy wine, it yields, on the addition of potash, a black precipitate; of ammonia, a deep green, bordering on black; of the prussiate of potash, a white, becoming violet, &c. These are most important observations, and ought to be generally known by all those who may be liable to be concerned in cases of poisoning. Our author next proceeds to consider the action of this poison when applied internally. Taken into the stomach in small doses, its effects are well known, and are such as to show beyond a doubt that it is absorbed into the system. In large doses, it seems capable of destroying life without being absorbed into the system, merely by the great disorganization it produces in that organ, and the shock necessarily given to the constitution by the injury. M. Orfila, however, seems to incline to the opinion of Mr. Brodie, whose experiments he relates, that in these instances it acts upon the brain and heart—simple inflammation of the stomach, according to him, being inadequate to produce the convulsive symptoms and speedy death occasioned by this poison; but after all, this only seems to be another mode of expressing the same thing, as the functions of the brain and heart are always affected by any violent injury done to an important organ, especially the stomach, a sudden blow upon which, without producing any evident disorganization, will instantly prove fatal. A very minute portion of this salt, artificially introduced into the sanguiferous system, destroys life; we do not however, agree with M. Lavort, quoted by our author, that this fact is sufficient to prove the non-absorption of it into the blood when applied to the stomach or surface of the body, as the circumstances in this case are very different, though we think it extremely probable that corrosive sublimate, *qua* corrosive sublimate, from its being so readily decomposed by animal matters, does not enter the sanguiferous system when applied in the above modes. From a variety of cases extracted

from different authors, M. Orfila states the symptoms produced by this poison to be

"An acrid, astringent, metallic taste in the mouth; a sensation of stricture and burning heat in the throat, anxiety, and rending pains in the stomach, and in the whole of the intestinal canal; nausea, frequent vomiting of a fluid sometimes bloody, accompanied with violent efforts, diarrhœa, sometimes dysentery; pulse small, hard, and frequent, lypothimia or great mental anxiety, general debility, difficulty of breathing, cold sweats, cramps in all the limbs, general insensibility, convulsions, death. The imprudent and continued use of this salt in small doses produces all the symptoms of which we have spoken in our examination of the action of the compositions of mercury on the animal economy."

This poison seems to act, as before observed, by producing general inflammation, &c. of the stomach and alimentary canal, but in the present state of our knowledge, M. Orfila confesses that it is impossible to point out in a precise manner the seat, extent, and character of the peculiar organic lesions which it produces.

Our author, according to the plan before mentioned, next comes to apply what he has before stated to practice. In the first case, when a portion of the poison can be obtained in its original state, its nature can be readily ascertained by the re-agents and methods formerly detailed. In the second case, when it can be only obtained in union with the alimentary matters, &c. it is by no means safe to trust to tests. The best mode of operating is now to mix a little of the suspected matter with caustic potash, and evaporate it in a porcelain or glass capsule to perfect dryness, and afterwards to heat it red hot in a small glass retort, fitted to a receiver. If mercury be present, it will be now found in a metallic state in the neck of the retort, often however, in such small quantity and in such a minute state of division, that it will be requisite to add a little nitric acid in order to take it up, in which state of combination its presence is easily detected by the re-agents, as in the former case. Many organic substances, as before stated, have the property of converting the oxymuriate of mercury into calomel, which, as is well known, becomes of a black colour on the ad-

dition of lime water. M. Chaussier therefore recommends us to digest the suspected substances in lime water; but our author has shown that this method is not to be trusted, because the black colour indicating the decomposition of the calomel is often not produced when this salt is in union with organic matters, either by lime-water or by potash, and M. Orfila has been often able to detect the presence of mercury by the method first mentioned, when the latter did not indicate its presence. In the third case, or where none of the poisonous substance can be procured, its nature of course can only be guessed at from the symptoms, the general circumstances of the case, &c. And in the fourth case, when the patient is dead, the contents of the stomach are to be collected and examined in the mode above mentioned; even the substance of these organs themselves should be examined, as the oxymuriate of mercury has been proved by our author to combine with them after death. Lastly, M. Orfila treats of the curative means to be adopted in cases of poisoning with this salt, and enquires into the efficacy of the substances which have been proposed by different authors as antidotes. On this part of the subject a number of curious and interesting experiments are related, which demonstrate the inefficacy of the alkaline salts and earths; the alkaline sulphurets, &c. proposed by M. Navier; also sulphuretted hydrogen, sugar, *infusum cinchonæ*, metallic mercury, &c. proposed by Duval and others. Albumen is the substance of all others which our author found most effective in counteracting the effects of this virulent poison, and he recommends that the patient should swallow as soon as possible several glasses of white of egg beat up with water; or if this substance cannot be procured, a decoction of linseed, marshmallow, &c. or even common water of the animal temperature, all which have the advantage, by encouraging vomiting, of being likely to expel the poison, and at the same time to moderate the irritation already produced. To prevent the effects of inflammation after this poison, bleeding, either topical or general, or both, will be often found necessary; and besides these, such other means must be had recourse to, as the peculiar symptoms may appear to indicate, and for which general rules can hardly be given. Our author next proceeds to treat of other preparations of

mercury, as the red oxide, the turbith mineral, or subsulphate, the nitrate, &c.; but as poisoning with these can very rarely happen, and as the mode of detecting them, their effects upon the system, &c. correspond with those already related, we refer to what has been said on the subject. He concludes by relating the effects of mercurial vapors, and states the result of several experiments, and quotes several authors to prove, that mercury, in the metallic state, exerts no action on the animal economy. He supposes that in those instances in which effects have followed its use in this state, it must have been oxidized —a circumstance easy to be accounted for from the minute state of division to which it was necessarily subjected.

Arsenical Poisons. M. Orfila justly observes, that "the preparations of arsenic are of all poisonous substances in the mineral kingdom, the most fatal, and are those with the properties of which the physicians ought to be best acquainted." He enters upon his subject as usual, by giving a minute account of the physical and chemical properties of this substance in its metallic state, in which state it does not appear to act as a poison. The most common form in which this metal is met with, and in which it is most generally used as a poison, is that of arsenious acid, or white oxide. The characteristic properties of this substance are, that on its being thrown on burning coals, it volatilizes and diffuses dense white vapors, having a strong garlicky smell. One thousand parts of water at a mean temperature, dissolve, according to Klaproth, about two and a half, and at a boiling temperature, about seventy-seven and a quarter; it is soluble also in alcohol and oils. In its aqueous solution, lime water produces a white precipitate; sulphuretted hydrogen and hydro-sulphuretted water, a golden yellow precipitate, as do also the hydro-sulphurets on the addition of an acid. Nitrate of silver produces a yellow precipitate, which becomes brown on exposure to light. The salts of copper, and especially the sulphate of ammoniacal copper, a fine green precipitate. The prussiate of potash, no precipitate. Albumen, gelatine, the sugar of milk, the resin of bile, &c. no precipitate. The arsenious acid, as well as the above precipitates, mixed with their own bulk of charcoal and potash, are easily revived by heat, and give out metallic arsenic. Many of the above re-

sults are considerably modified and changed, by mixture with organic products and substances commonly taken as aliments, for the details of which, we must refer to the work itself, as by extracting partial facts, we can by no means do justice to our author on this point. The nature of the action of this poison upon the animal economy is very obscure, and our author, after detailing Mr. Brodie's experiments, and seeming to object to the conclusions drawn by that gentleman, offers after all, very similar ones. It evidently exerts little apparent chemical action on organized products in general, and its influence on the animal economy, is often not evident till some time after it has been taken into the stomach. Symptoms of inflammation of this organ indeed, as well as of the intestines, occur, but these are generally of such a description, as to be apparently inadequate to account for the fatal effects which so constantly follow; and in short, we confess ourselves dissatisfied with every attempt to explain these effects, except the general one, that this metal is capable of inducing death by its deleterious action upon the nervous system.

From the cases detailed by our author, he concludes generally, that the symptoms induced by this poison, are as follow:

"An austere taste, fetid mouth, frequent ptyalism, continual inclination to spit, constriction of the pharynx and œsophagus, the teeth set on edge, hiccup, nausea, vomiting of a matter sometimes brown, sometimes bloody; anxiety, frequent faintings, heat of the *præcordia*, inflammation of the lips, tongue, palate, throat and œsophagus; the stomach painful to such a degree, as to be unable to support the most emollient drink, the alvine discharge blackish and very fœtid; pulse small, frequent and irregular, sometimes slow and unequal; palpitation of the heart, syncope, unquenchable thirst, pungent heat all over the body, sensation as of a devouring fire; sometimes an icy coldness, breathing difficult, cold sweats, urine scanty, red and bloody, change of the features of the countenance, a livid circle round the eyelids, swelling and itching over the whole body, which is covered with livid spots, and sometimes with miliary eruption, prostration of strength, loss of feeling, particularly in the feet and hands, delirium, convulsions, often

accompanied with an insupportable priapism, falling off of the hair, detachment of the epidermis, and lastly death."

As before observed, there are generally marks of inflammation to be observed after death in the stomach and other viscera of a person poisoned by arsenic, but these are generally insufficient to account for that fatal event. In applying what has been said to practice, in each of the four cases before mentioned, it will be easy in the first of these, or where a portion of the poison can be obtained, to ascertain its nature by the means formerly described. In the second case, or where the poison is mixed with alimentary substances, if the quantity of these be small, they may be evaporated to dryness, mixed with potash and charcoal, and the arsenic revived; but if the quantity be large, M. Orfila recommends them to be mixed with excess of hydro-sulphuret of ammonia, and the yellow precipitate thus obtained to be revived in the same manner as before. In the third case, where none of the poison can be obtained, information of its nature can of course be only derived from the concomitant circumstances; and in the fourth case, when the patient is dead, our author gives us in detail the methods of Hahnemann, Rose, Roloff, and Fischer, for detecting this poison. He objects, however, more or less to all these, and recommends another method of his own, which he considers as combining the advantages of the former methods, without their defects. This consists in boiling the contents of the stomach, and even in doubtful cases the stomach itself, in distilled water, testing this as before advised, and if arsenic be suspected, to collect the whole of it by adding hydro sulphuret of ammonia, and reviving the yellow sulphuret formed in the manner just recommended. In short, the only safe way in cases of poisoning by arsenic is, if possible, to obtain it in the metallic state. Our author confirms the important observations of Mr. Brodie, that this metal can often not be detected in the stomach or intestines after death, the whole being ejected by vomiting. This shows the necessity of examining the matters thus thrown out.

M. Orfila now comes to consider the method of treatment to be adopted in cases of poisoning by arsenic. He relates the

results of his experiments made with the view of ascertaining the powers of the different substances, alleged to be antidotes to this poison, such as the alkaline sulphurets, sulphuretted hydrogen, different fatty substances, lime-water with milk, theriaca, &c. all which he proves to be quite inefficacious, and some of them even dangerous. He recommends the administering of large quantities of tepid water, milk, decoctions of linseed, &c., and the production of vomiting by tickling the throat with a feather, &c. Should inflammation afterwards take place, the usual means must be had recourse to, and as the subsequent state of convalescence is commonly long and painful, great attention must be paid to the regimen, &c. of the patient.

The poisonous properties of arsenic cannot be overcome by union with any known substance, and hence there is no proper antidote. Hence likewise, all its compounds act as poisons when taken into the stomach, but as the general properties, symptoms, &c. are the same as those above described, the same modes of detecting them, and of averting their deleterious effects, are to be adopted. Arsenic also inhaled in a state of vapour into the lungs, sometimes proves instantly fatal, and at other times induces death slowly by *phthisis pulmonalis.*

Antimonial poisons. Antimony given in its metallic state, has been known to prove fatal, probably by becoming oxidized in the *primæ viæ.* The most common compound of this metal, and therefore the most likely to be taken, is the tartar emetic, or the tartrate of potash and antimony, and it is to this preparation that M. Orfila has chiefly confined his observations, most of which however, may be applied to all the preparations of this metal. This salt is soluble in water, and in this solution, sulphuretted hydrogen and the hydrosulphurets produce an orange yellow precipitate when employed in small quantities, and a deep brown red if employed in excess. Concentrated sulphuric acid produces a white precipitate; lime-water and barytic-water, a white precipitate, both which are soluble in acids. The alkaline sulphates produce no precipitate; the carbonate of soda a white precipitate. Most vegetable juices and extracts produce precipitates, often of a reddish yellow colour; the tincture of galls, however, is one of the most delicate tests

of this substance, the precipitate produced is curdled and of a dirty white colour, inclining to yellow. Albumen, gelatine milk, broths, &c. do not affect a solution of this salt, though wine and many other substances mixed with it, so modify the action of the above tests, that it is impossible to recognize it by their means. Thus, when mixed with wine, the hydrosulphurets produce first a reddish yellow, and then a green and even a black precipitate; infusion of galls, a violet precipitate, &c. This salt is decomposed by heat, and yields metallic antimony and potash. All the above precipitates can likewise be easily reduced by calcination with potash and charcoal.

M. Orfila next inquires into the poisonous properties of this salt. In small doses it proves its own antidote, by producing vomiting. Six or eight grains injected into the veins of a full grown dog, induce vomiting, frequent stools, difficulty of breathing, and finally death, commonly within an hour after the operation. After death, the lungs are found of an orange or violet colour, distended with blood, &c. and the mucous membrane of the intestinal canal, from the cardia to the extremity of the rectum, is red and strongly injected. Twelve or eighteen grains injected in this manner, prove fatal in half an hour, whilst the animal will often survive four grains for twenty-four hours; and in the latter case, the same appearances of the lungs and intestines are produced, whilst in the former, the lungs only are affected. What is singular, precisely the same appearances are found if this salt be taken into the stomach, or applied to an absorbing surface. Hence our author concludes with M. Magendie, that this salt produces death by being absorbed into the mass of blood, rather than by its direct influence on the stomach. The general symptoms produced by this poison are,

"A rough metallic taste, nausea, copious vomitings, frequent hiccup, cardialgia, burning heat in the epigastric region, pains of the stomach, abdominal colic, inflation, copious stools, syncopes, small concentrated and accelerated pulse, skin cold, sometimes intense heat, breathing difficult, vertigoes, loss of sense, convulsive movements, very painful cramps in the legs, prostration of strength, death."

The organic lesions, as before observed, which pretty con-

stantly follow the cure of this poison, are inflammation, more or less extensive, of the lungs and mucous membrane of the digestive canal; the brain also has in some instances been found affected. In applying what has been said on this poison to practice, in the first case, or when the salt can be procured unmixed, its nature can be ascertained by the means already mentioned. In the second case, when it is obtained in mixture with alimentary matters, the best mode is to calcine them with an equal weight of black flux, by which means the metal will be obtained in its pure state, and the same method may be also adopted with the contents of the stomach obtained after death. It is probable, however, if the dose were small, that the whole of it might be absorbed, and thus none be discovered in either of these cases. In the treatment of persons poisoned by the salt, the author prefers the promoting of vomiting, by drinking largely of tepid water, tickling the fauces, oil, &c., to the substances used as antidotes, as the infusions of cinchona, nut-galls, &c. Though these, or even a strong infusion of tea or other astringent substance, may be given in case vomiting cannot be induced in a short time. The author however justly reprobates the use of earths, alkalies, alkaline sulphurets, &c., as tending rather to increase the irritation produced by the poison. In cases of violent and continued vomiting, opiates may be useful, and where inflammation has taken place, bloodletting, and the usual remedies employed in that case, may be had recourse to.

Most of the other preparations of antimony prove violently emetic, and act as poisons. Their nature may be ascertained by heating them with the black flux, and thus reviving the metal, while the general symptoms, mode of treatment, &c., differ in no respect from those recommended in cases of poisoning, by the tartar emetic. Persons exposed to the fumes of antimony, have been known to become affected with difficulty of breathing, cough, hæmoptysis, gripings, diarrhœa, &c., which if they continued for sufficient time, would undoubtedly prove fatal.

Cupreous Poisons. Copper in its metallic state, does not seem to possess any deleterious properties. The oxide and carbonate are both poisonous, and these are liable to be form-

ed by the contact of any acid or fatty matter with a copper vessel, especially if they are boiled in it, and afterwards suffered to cool and stand exposed for some time to the air. Verdegris however, is the most common preparation of this metal, whose poisonous effects we have to encounter. This substance is usually a compound of the acetate, subacetate, carbonate and oxide of copper. The characteristic properties of this substance, are its green colour and partial solubility in water. The hydrosulphurets throw down from this solution a black precipitate. Phosphorus and iron, on being put into it, become covered with metallic copper. Caustic potash and ammonia in small quantities, cause a green precipitate, but if they are added in excess, they re-dissolve it. Arsenious acid instantly produces a green precipitate. The chromate of potash, a beautiful yellow one. The prussiate, a brown one. Tea produces a flaky reddish yellow precipitate. Albumen a bluish coloured precipitate. Gelatine, broth, &c. do not affect it; but if added in large quantity to milk, this fluid is coagulated. The action of these tests as usual, however, is considerably modified by various substances, as for example, red wine. A solution of verdegris in this fluid, yields a black precipitate with the hydrosulphurets; a brown with the prussiate of potash; and a dark grey or black with ammonia, which is not redissolved by an excess of the alkali. All these substances by charcoal and heat, yield metallic copper. A single grain of the acetate of copper injected into the jugular vein, proves fatal to dogs in ten or twelve minutes, and twelve or fifteen grains taken into the stomach, prove generally fatal to the same animal in less than three quarters of an hour. This poison does not seem to induce death by its immediate action upon the stomach and alimentary canal, but by being absorbed into the circulating mass, and thus acting upon the brain and nervous system, and perhaps also the lungs. The symptoms of poisoning by this salt are,

"An acrid styptic coppery taste in the mouth, parched and dry tongue, a sense of strangulation in the throat, coppery eructations, continual spitting, nausea, copious vomitings, or vain efforts to vomit; shooting pains in the stomach, which are often very severe; horrible gripes and frequent alvine evacua-

tions, sometimes bloody and blackish, with tenesmus and debility, the abdomen puffed up and painful, pulse small, irregular, hard and frequent, syncope, heat of skin, ardent thirst, difficulty of breathing, anxiety of the *præcordia*, cold sweats, scanty urine, violent head-ache, vertigoes, faintness, weakness in the limbs, cramps, convulsions and lastly, death."

In the stomach and intestines of those who have died from this poison, there are always marks of inflammation, and sometimes gangrene, if the unhappy victims have survived a sufficient length of time.

On applying what has been said of this substance to practice, there will be no difficulty of ascertaining the nature of the poison when it can be procured, from the enumeration of its properties before mentioned. When mixed with the alimentary matters, the best method undoubtedly is, to expose the whole to heat, and thus reduce the metal; if its quantity be very minute, it may be re-dissolved in nitric acid, and its properties ascertained by tests as before. The same remarks apply to substances taken from the stomach after death; and it will be even proper to calcine the inner coats of the stomach themselves, as M. Orfila often detected the presence of this metal by these means. The hydrogenated sulphurets of potash, lime, iron, &c. formerly recommended as antidotes, besides being too irritating, are likewise ineffectual, as are the alkaline and earthy salts, and the infusion of nutgalls. Of all substances known at present, sugar is one of the most effectual antidotes to this poison. The first care therefore, of the medical man called in to a case of poisoning by this substance, should be to administer large quantities of sugar, either in solution or otherwise, and if this cannot be procured, diluting and mild fluids, as broth, or even warm water should be administered, and vomiting encouraged by every possible means. When inflammation has taken place, the usual antiphlogistic remedies should be resorted to, and if convulsive effects follow, narcotics and anodynes may be administered with advantage.

Most of the other salts of copper, especially the sulphate, nitrate and muriate, likewise act as poisons. From what has been said, the mode of detecting these, the general plan of treatment, &c. will be easily understood.

Poisons from Tin. Tin in the metallic state is not poisonous. The muriate of tin is the only preparation of this metal which is likely to be swallowed by accident or design. The characteristic properties of this salt are, its solubility for the most part in water, which solution, on being dropt into a solution of the muriate of gold, commonly yields a beautiful purple precipitate. By the hydrosulphurets, a black precipitate is produced. By the precipitate of potash, a white precipitate often becoming blue. Infusion of tea, and tincture of nutgalls, produce a yellow precipitate. Burgundy wine, a violet one. Albumen, white; gelatine, white. Milk, even in a large quantity, is instantly curdled by a few drops of a solution of this salt. Human bile, yields flaky curds. This salt, even in very small quantity, proves instantly fatal on being injected into the veins of animals, and in small doses taken into the stomach it seems to produce death by being absorbed, and thus brought to act on the nervous system. In large doses, it produces death, by corroding and inflaming the stomach and intestines. The symptoms produced by this substance as enumerated by M. Orfila are,

"An austere, metallic, intolerable taste, a sensation of constriction in the throat, nausea, repeated vomitings, a sharp pain in the epigastric region, which in a short time extends to the other regions of the abdomen, copious evacuations of the bowels, slight difficulty of breathing, pulse small, hard and frequent, convulsive motions of the muscles of the extremities and face, sometimes paralysis, and generally death."

It is not possible to discover the nature of the poison from the inflammation, &c. of the stomach and intestines which it produces, as these phenomena exhibit nothing peculiar. If a portion of the salt can be procured, its nature may be ascertained by the foregoing properties; but if it be obtained in union with alimentary matters, the best mode will be as before, to reduce the salt to the metallic state by heat. M. Orfila recommends milk as a very effectual antidote to this poisonous substance. Hence the propriety of having recourse to this fluid, or in case it cannot be procured, to diluting mucilaginous liquors, in order to excite if possible, vomiting. If inflam-

mation or distressing nervous symptoms follow, recourse must be had to the usual means of allaying them. Of the other preparations of tin, our author only mentions the oxide, which in large doses proves fatal to animals. Should a case of poisoning occur by this substance, the means to be adopted will be obvious from what has been said.

Poisons from Zinc. Zinc, or its simple oxide, does not appear to possess very deleterious properties. The sulphate is the most common, and perhaps the most active preparation of this metal; M. Orfila therefore, chiefly confines his observations to it. The sulphate of commerce almost always contains iron and sometimes copper; hence the colours of the precipitates usually vary, and are different from those obtained from the salt in its pure state. The following observations apply to the salt as usually met with in commerce. It is soluble in water. Potash and ammonia precipitate from this solution an oxide of a greenish white colour, easily soluble in excess of alkali. Prussiate of potash, often a precipitate of a bluish colour; the hydrosulphurets usually a blackish precipitate from the iron present. The chromate of potash, an orange yellow. Infusion of galls and tea, a deep violet blue precipitate, likewise from the iron present. Burgundy wine, no precipitate. Gelatine, a few flakes of a yellowish white; albumen, a white precipitate. Milk is curdled by it, if added in sufficient quantity. Human bile produces a few flakes of a yellow colour. Injected into the veins, it seems to produce death, by its action upon the brain and lungs. If taken into the stomach, it instantly produces vomiting, and is thus rejected; but if retained, it seems capable of inducing death, by exciting inflammation and its consequences. The symptoms produce by this poison, according to M. Orfila, are,

"An astringent taste, sense of strangulation, nausea, copious vomitings, frequent stools, pains in the epigastric region, extending afterwards over the whole abdomen, difficulty of breathing, frequency of pulse, paleness of the countenance, and coldness of the extremities."

In cases of larger doses of this salt being taken, the physician should always, as M. Orfila observes, keep in view its power-

ful emetic properties, which he should endeavour to promote by the exhibition of warm water and emollient drinks.—As an antidote, milk is recommended as the best. In cases of inflammation produced by this salt, the usual means must be resorted to.

Poisons from Silver. Pure silver, or its oxide, does not appear to possess poisonous qualities. The most active preparation of this metal is the nitrate. A solution of this salt, of which the common lunar caustic is a familiar example, yields, on the addition of muriatic acid or any of the muriates, a white precipitate, which becomes black on exposure to light. Potash and lime produce a deep brown precipitate; the hydrosulphurets, a black one; the chromic acid, red; and the arsenious acid, yellow. Ammonia does not disturb it, and copper and phosphorus separate from it metallic silver. Dissolved in Burgundy wine, this fluid becomes slightly turbid, and acquires a violet colour. Muriatic acid still produces a white precipitate from this mixture; the hydrosulphurets, a greenish brown; the phosphate of soda instead of a yellow, a violet blue. Added in considerable quantity to infusion of tea, this salt produces a flaky deep red purple precipitate. In less quantity, the infusion is changed to a black, without any alteration in its transparency. It precipitates albumen copiously. It does not affect gelatine or milk, except added in considerable quantity. With bile, it produces an orange yellow precipitate; and with broth, a dense yellowish white one. Injected into the veins, the smallest quantity seems to prove fatal, apparently by its action upon the lungs and nervous system. Taken into the stomach in large doses, it seems capable of producing death, by destroying the texture of that organ. If the mucous membrane be not destroyed, it is rendered more or less red; but if the dose has been large, it will be found entirely destroyed, and the muscular coat very much inflamed and of a bright red colour, and sometimes all the coats of the stomach will be found perforated. Exhibited as a medicine in large doses, it generally produces severe vomiting and diarrhœa, with intense head ache, but these unpleasant symptoms may be obviated by combining it with opium. From the properties before mentioned of this salt, and its easy reduction, it may be

recognized without difficulty, even when in small quantity, and mixed with excrementitious matters. The best antidote to this salt is the muriate of soda. This may therefore be dissolved in small quantity in warm water, of which copious draughts may be administered frequently. Emollient drinks may be afterwards had recourse to, and the usual means employed, if inflammation should ensue.

Salts of Gold. Gold in its metallic state is not poisonous; but the muriate of this metal seems to exert very powerful action on the animal economy. It dissolves in water, and the solution is yellow, and stains the skin permanently purple. Ammonia precipitates it in reddish yellow flakes, which when dry fulminate violently by heat. Potash produces a brownish red precipitate. The prussiate of potash no precipitate. The hydrosulphurets, a deep chocolate precipitate. A solution of green sulphate of iron precipitates the gold in the metallic state. The muriate of tin produces a fine purple precipitate. Sugar produces no effect. Infusion of tea produces a reddish yellow precipitate. Mixed with Burgundy wine, a beautiful deep purple precipitate is produced, and the metal is partly reduced. Albumen produces a yellow precipitate: gelatine, a precipitate in yellow filaments. Milk is instantly coagulated by it. Human bile is precipitated green, which becomes purple. M. Orfila's experiments show, that a very small quantity of this salt injected into the sanguiferous system, proves fatal, apparently by its action on the lungs. Taken into the stomach in large doses, it likewise proves fatal, by producing inflammation of the stomach and intestines. No case of poisoning by this salt was known to M. Orfila, but if such should happen, the nature of the poison could be easily ascertained if it could be procured, by the above mentioned detail of its properties, and as no antidote is known, the usual means, especially the production of vomiting, should be had recourse to. Some cases are related, which demonstrate the poisonous properties of the fulminating precipitate above mentioned.

Salts of Bismuth. All the compounds of this metal with oxygen, seem to be poisonous. M. Orfila confines himself, however, to the nitrate of bismuth; the properties of which are briefly as follow: It reddens litmus, and on being mixed with

a large portion of water, after some time a white precipitate, which is the subnitrate of bismuth, is produced. Sulphuretted hydrogen, and the hydrosulphurets, produce a black precipitate. The prussiate of potash, a pale yellow one. The chromate of potash, a beautiful orange yellow. Infusion of galls, and a strong infusion of tea, a pale flaky yellow precipitate. Mixed with Burgundy wine, a violet precipitate, more or less abundant according to the quantity added, is produced. Albumen, milk and human bile are precipitated by this salt, but gelatine is not affected by it. All these precipitates can be easily reduced, by exposing them to a strong heat with charcoal. Nitrate of bismuth injected into the veins seems to prove fatal, chiefly by acting on the lungs; taken into the stomach in large doses, it corrodes that organ, and at the same time seems to act upon the lungs. The symptoms produced are, the most distressing anxiety, nausea, vomiting, diarrhœa or constipation, colic, vertigoes, faintings, convulsions, and death. The nature of the poison, if it can be procured, can be easily discovered from the foregoing enumeration of its properties, and of the substances to be exhibited, "milk and sweet mucilaginous drinks deserve the preference."

The concentrated Acids. None of the acids in their dilute state, are perhaps to be strictly considered as poisons; but the three mineral acids, namely, the *sulphuric*, the *nitric*, and the *muriatic*, and perhaps also the *phosphoric*, in their concentrated form, may be classed among the most active and destructive agents known. A common property they possess, is that of changing vegetable blues to red. The characteristic properties of the sulphuric acid are, its great specific gravity, its forming with the barytes, and lead, very insoluble white compounds, and its yielding the smell of burning sulphur on being boiled with mercury. For nitric acid there is no single test that can be relied upon. But it may be easily discovered by combining it with any base, especially an alkali, and exposing the salt to a strong heat in contact with charcoal, when a vivid inflammation or detonation takes place. Heated also with charcoal, sulphur or phosphorus, or poured on copper filings, it is decomposed, and copious orange yellow vapours are given off. Muriatic acid may be known by its forming, on the addi-

tion of nitrate of silver, a dense white precipitate, which becomes of a deep purple or black on exposure to light, and by its yielding a suffocating greenish coloured gas (chlorine,) on being heated with the black oxide of manganese. Phosphoric acid yields phosphorus on being heated with charcoal, and forms white precipitates with lead, lime, and barytes, which are soluble in acids, and precipitable again by ammonia. Sulphuric and nitric acids render Burgundy wine of a lighter red; muriatic acid changes it to rather a deeper shade; and phosphoric acid does not affect it. Neither of them precipitate a solution of gelatine, but render it somewhat more transparent. They all instantly coagulate albumen,* milk, bile and blood. M. Orfila's experiments show that, injected into the veins of animals, even in small quantity, they instantly destroy life, apparently by coagulating the blood; that taken into the stomach, they speedily induce death, by totally disorganizing and destroying that viscus, and that if applied even externally to any extent, the animal either sinks under the first effects of the corrosion they occasion, or else from the copious suppuration which succeeds it. The symptoms they produce differ but little from one another, and are of the most terrible kind. The phosphoric, however, is the least active. A severe burning heat is felt in the mouth, œsophagus and stomach, the most distressing vomitings take place, of an acrid matter, sometimes as black as ink, sometimes solid, and at times mixed with blood. Pulse frequent, small, and often irregular; coldness of the skin, particularly of the legs and thighs, great tenderness of the abdomen, with severe gripes, and sometimes bloody stools, deglutition difficult or impossible, the countenance pale and expressive of the utmost anxiety, cold sweats, &c., and death. In some instances, however, when a large quantity of concentrated nitric acid has been taken, the pain has been less severe before death, and sometimes even from the beginning, which M. Tartra, quoted by our author, considers as an unfavourable circumstance, and as demonstrating the total disorganization and death of the affected parts. On

* It may however be proper to observe, that dilute phosphoric acid does not coagulate albumen.

examination after this event, the œsophagus and stomach are found inflamed, ulcerated and gangrenous, or where the sulphuric acid has been taken, reduced to a black jelly. The nitric acid usually gives the parts over which it has passed, a yellow or orange tinge. In general there can be little difficulty of ascertaining when these acids have been taken, and the peculiar nature of the acid may be easily learnt from the description of their characteristic properties before mentioned. Of all the antidotes, calcined magnesia, as recommended by M. Orfila, is undoubtedly the best; it may be given suspended in diluent and mucilaginous drinks. If this cannot be procured, a weak alkaline solution, or a strong solution of soap and water, may be used. Some have also recommended large doses of oil, or almonds. If the quantity taken has not been so large, but that hopes of recovery are entertained, emollient drinks and glysters, the warm bath, &c., may be had recourse to, in addition to the general means for obviating the effects of inflammation. The effects of the other mineral acids, as the nitrous, phosphorous, &c. are stated to be similar to the above mentioned, except those of the fluoric, which according to Thenard, "is of all bodies the most corrosive," and acts with such energy on the organic texture, that it would doubtless speedily induce death, even when applied externally.* Of the vegetable acids, the oxalic, since M. Orfila's work was published, has been found to act as a violent poison, and to prove speedily fatal to the human subject, in doses of less than an ounce. Ten grains were found by Mr. Robarts, to kill a healthy rabbit in five minutes, and a drachm proved fatal to a middle sized dog in ten minutes.† This acid may be known by its crystallizing in the form of four sided prisms, terminated by dihædral summits, and by the white precipitate it forms with lime water and all solutions of the salts of this earth, which precipitate is soluble in nitric acid. If we can rely upon the observations of Mr. Robarts, it seems to induce death, by sympathetically affecting the brain and heart, from the disorganization of the stomach which it produces. What

* See Traité de Chimie Elémentaire, tom. I.

† See the London Medical Repository, vol. iii. p. 380.

is singular, Mr. Robarts found evident traces of the acid in the blood. An antidote, which has been recommended by Mr. Thompson, is carbonate of lime; but calcined magnesia would be doubtless better, as the carbonic acid liberated from the chalk would be likely to prove distressing to the patient. Whether the tartaric and other vegetable acids act as poisons, we do not know, but we think it very probable, that in large doses and a concentrated form, they would prove equally so with the oxalic.

The caustic and carbonated Alkalies. Concentrated solutions of all the alkalies act very energetically on organized substances. They all change the vegetable blues to green. Potash may be distinguished by producing a brownish yellow precipitate with the muriate of platina, and a compound but little soluble in water with the tartaric acid, whilst soda does not possess these properties, at least not the first. Ammonia is readily distinguished by its peculiar odour and volatility. These alkalies form salts with the different acids, most of which are soluble in water. They change the colour of Burgundy wine to green, and do not precipitate gelatine, albumen, milk or bile, or coagulate the blood, but prevent the spontaneous coagulation of this fluid. Notwithstanding this property, however, M. Orfila found, that potash injected into the veins, coagulates this fluid, which is a remarkable fact. When thus injected they all prove speedily fatal. Taken into the stomach, potash and soda destroy life by inflaming, corroding and destroying this organ. Ammonia, according to our author, sometimes induces death in a similar manner, and sometimes by acting on the nervous system, and particularly the vertebral column. The symptoms produced by potash and soda, are "a styptic, urinous, and caustic taste, a severe burning in the throat, vomitings, sometimes of bloody alkaline matter, copious alvine evacuations, a most severe pain in the epigastrium, &c., and if taken in any quantity, death soon takes place."

The most common effects produced by the alkalies are, besides the usual effects of inflammation, perforations of the stomach. In cases of poisoning by them, there will be but little difficulty in detecting their general nature, and the particular

alkali may be easily distinguished, by attention to the above characteristic properties. The best antidote to the alkalies, according to M. Orfila, is vinegar diluted with much water, not only from its property of neutralizing their properties, but from its power of inducing vomiting. After the first symptoms are relieved, such means should be employed as are calculated to prevent or arrest inflammation of the abdominal viscera.

The alkaline Earths. Barytes and the carbonate and muriate of Barytes. This earth and both the compounds mentioned, prove active and virulent poisons. It may be readily distinguished in a state of solution, by the white insoluble precipitate which it forms on the addition of sulphuric acid or any sulphate, which precipitate does not assume a black colour on exposure to sulphuretted hydrogen. The alkaline sulphurets also, do not produce a change of colour in a solution of barytic salt. M. Orfila chiefly confines his observations to the muriate of barytes, the poisonous properties of which are best known. Burgundy wine, from the sulphates which it contains, is slightly affected by the muriate of barytes. It does not affect gelatine, albumen, or milk, but precipitates bile of a greenish yellow colour. Injected into the veins in very small quantity, it proves fatal; as it does when taken into the stomach, or applied externally to a wounded surface; and our author concludes from his own experiments and those of Mr. Brodie, which he relates, that this salt injected into the veins, produces death by acting on the nervous system, and coagulating the blood, and that when applied externally, or introduced into the stomach, it exerts its action likewise upon that system, after having been absorbed and carried into the current of the circulation. It produces moreover in these circumstances, inflammation of the texture with which it comes in contact. Mr. Brodie drew a similar conclusion from his experiments, namely, that it occasions death by acting upon the brain and heart. Our author knew no instance of poisoning from this earth, or its compounds, but observes, that should such an accident occur, the nature of the poison could be readily distinguished by the characteristic properties above enumerated. From the very little effect this earth appears to produce on the animal economy, when combined with sulphuric acid, a solution of

the sulphate of soda or magnesia, or some other soluble sulphate, is recommended as its best antidote. After which, vomiting may be excited. The subsequent treatment, of course, must vary with the nature of the symptoms. *Lime* in its pure state taken into the stomach, appears by M. Orfila's experiments, to prove fatal, by inducing inflammation of that organ. But as this accident is so little liable to occur, we think it quite unnecessary to enter into the detail of its properties and the symptoms it produces, which appear indeed to be nothing more than those of common inflammation. We are rather surprised that our author has not noticed the *muriate of lime*, which seems capable of producing poisonous effects on the animal economy, and is much more liable to be swallowed than *quick lime*.

Phosphorus. The wax-like appearance and easy inflammability of this substance, readily enable us to distinguish it from every other known. In its pure state it appears to exert no sensible action on gelatine, albumen, milk or bile, all of which like watery fluids in general, are incapable of dissolving it. Dissolved in oil of cloves, and injected into the veins, it is elicited from the lungs, according to M. Orfila, under the form of phosphorous acid, and speedily proves fatal. It is no less fatal when taken into the stomach in any considerable quantity. In the first case, violent inflammation of the lungs is produced, and in the last, similar inflammation of the stomach and intestines, apparently from the heat evolved during the combustion of the phosphorus, and perhaps also the irritating qualities of the concentrated acids formed by this combustion. Hence the symptoms produced by this substance, and the lesions of texture observed after death, very closely resemble those of common inflammation of the stomach and intestines. In cases of poisoning by phosphorus, there can be but little difficulty in discovering the nature of the poison, and M. Orfila recommends as the best step to be adopted, the speedy administration of an active emetic, with copious draughts of water holding magnesia in suspension, which will combine with any acid as fast as it may be formed, while the water will displace the atmospheric air, and thus prevent the further combustion of the phosphorus, and at the same time favour its ejection by vomiting.

Glass and enamel in Powder. Our author very naturally hesitates in ranking these substances among poisons. His own experiments and those of others which he relates, appear to show, that when they are in a state of very fine powder, they ordinarily produce no deleterious consequences; but if the fragments are large and angular, as might be naturally expected, the reverse is the consequence; but even in this case, the effects produced do not appear to be always so severe as might be supposed. In accidents of this kind, it is obvious that little can be done. If it has recently occurred, perhaps the best plan will be to distend the stomach with some pultaceous substance, and induce vomiting.

Cantharides. (*Lytta vesicatoria.*) M. Orfila, after describing this insect, relates its chemical properties, as ascertained by M. Robiquet. Not one of these, however, as is the case with most organized objects, affords such characteristic properties as will enable us to distinguish the substance in question, especially when in a state of solution. Such a solution injected into the veins, speedily proves fatal. Taken into the stomach also in any considerable quantity, these insects produce the most horrible symptoms, and in a very short time death itself; and M. Orfila's experiments and observations induce him to conclude, that when injected into the veins, their poison acts chiefly upon the nervous system, and especially the vertebral column; that taken into the stomach, it produces violent inflammation of that viscus, and also of the urinary organs, and appears to act likewise upon the nervous system; and lastly, that applied externally, it sometimes destroys animals by the same sort of action which it exerts when introduced into the stomach. The symptoms produced are stated by our author in the following manner:

"A most unpleasant and infectious (*infecte*) odour, a disagreeable and acrid taste, frequent nausea and vomiting, abundant and often bloody alvine evacuations, violent epigastralgia, most severe gripes and excruciating pains in the hypochondria, heat in the bladder, urine sometimes bloody, and obstinate and sometimes painful priapism, pulse frequent and hard, a very disagreeable sensation of heat and ardent thirst, some-

times a horror of liquids, frightful convulsions, tetanus, delirium, &c. &c."

The lesions of texture produced by these insects are, as before observed, violent inflammation and ulceration of the stomach and intestinal canal, and often of the urinary organs. If they have been administered in powder, the nature of the poison may be ascertained, by attentive examination, from the number of beautiful shining points of a fine green colour, derived from the external covering of the wings. When given in solution, we can only guess at the nature of the poison from the history of the case, and the symptoms. As to the treatment of those who have been poisoned by these insects, mild emetics, as oil, emulsions, &c. in large quantities are recommended, and to obviate the common symptoms of inflammation, the usual means must be resorted to—nothing like a specific remedy or antidote being known for this active and deleterious poison.

Class II. *Astringent Poisons.* In this class *Lead* stands alone. This metal, like most others, in its natural and uncombined state is not poisonous, but it readily combines with oxygen and acids, and in this state it exerts its baneful effects with the greatest energy. The most common preparations of this metal, and which are objects of commerce, are the acetate, or sugar of lead, the red oxide, or red lead, the yellow oxide, or litharge, and the carbonate, or white lead, the chemical properties of which are detailed at length by M. Orfila, but of which, according to our plan, we shall only notice those which are sufficient merely to enable any one acquainted with the common principles of chemistry to distinguish them.

The acetate of lead yields copious fumes of acetic acid, when sulphuric acid is poured upon it. It is soluble in water, and forms a dense white precipitate on the addition of an alkaline sulphate or carbonate; a black precipitate on the addition of sulphuretted hydrogen, or the hydroguretted sulphurets, and a fine yellow precipitate on the addition of chromate or hydriodate of potash. These precipitates on being exposed to a strong heat, with potash and charcoal, yield metallic lead. The acetate of lead precipitates Burgundy wine. It likewise

precipitates albumen, milk, and bile, also broth, but not gelatine. The red oxide of lead is known by its beautiful colour and density, and by its yielding, on being heated with charcoal, metallic lead. Litharge usually exists under the form of reddish or yellow scales, and likewise yields metallic lead on being heated with charcoal. White lead may be distinguished by its density, by its yielding carbonic acid on the addition of an acid, and more certainly by its yielding metallic lead on being subjected to heat with charcoal. Burgundy wine dissolves a considerable proportion of litharge, loses most of its colour, and acquires a sweetish taste, and from this state of solution the lead may be precipitated on the addition of the different substances before-mentioned, nearly in the same form. Wines, syrups, spirits, &c. often contain lead in solution. Distilled water, and very pure spring water, have likewise the property of dissolving this metal, a remarkable instance of which has lately occurred at Tunbridge Wells, and of which an account has been just published by Dr. Thomson. Many articles of food also, kept, and especially salted or cooked, in leaden vessels, are liable to become impregnated with this deleterious metal.* M. Orfila's experiments induce him to conclude, that the acetate of lead introduced into the circulation is not so energetic a poison as most of the other metallic salts, except in doses of several grains, when it is capable of producing violent symptoms, followed by death, more or less speedy; the cause of which appears to depend upon its action upon the nervous system. Taken into the stomach in a large dose in a solid form, it produces death in the course of a few hours, even when the animals are allowed to vomit; and that apparently in consequence of its inflaming and corroding the alimentary canal. Taken in a state of solution, in large quantity, its fatal effects seem to depend more upon its being absorbed, and then acting upon the nervous system. In small doses its action appears to be confined to the exciting of vomiting, and increasing the alvine discharges. The same effects take place from other

* It has also been said, that not only the subcarbonate of potash of commerce, but what have been sold even for pure potash and soda, have been lately found to contain lead.

preparations of lead. But by far the most common and terrible effects of this metal are produced when it is introduced for a long time together in small quantities into the constitution, and to which all those who have much to do with lead in any way are liable. These effects have been observed and known from the earliest times, and have acquired various names, of which perhaps the *lead colic* is the most appropriate. Their progress is sometimes rapid, but generally the reverse, and they commence with gripings, more or less severe, about the umbilicus; the abdomen retracts spasmodically, and becomes hard and knotty; there are often eructations, with nausea and vomiting; the most obstinate costiveness prevails, but no fever; and there is a tendency, especially in the latter stages, to paralysis of the extremities—a circumstance which we are surprised to find so little dwelt upon by M. Orfila. The preparations of lead, taken in large doses, as before mentioned, produce inflammation; but numerous dissections on record of those who have died from the lead colic, show that inflammation cannot be the cause of death in this disease: and according to M. Orfila, a contraction of the diameter of the great intestines, particularly of the colon, is the only thing observed; so that this metal seems to exert its baneful influence chiefly on the nervous system. M. Fodéré indeed says, that in those who die of this disease, the mesentery and its glands, with the chyliferous and lymphatic vessels, and other important viscera, are inflamed and obstructed, and thus appears to conclude, that it destroys life by inducing marasmus; but these circumstances are denied by our author. When a large portion of any preparation of lead has been swallowed, if any portion of it can be procured, its nature can be easily ascertained; but it is singular, that in those who die of lead colic, and by whom the poison has been slowly taken into the constitution, not a particle of lead, according to Barruel and Merat, as quoted by M. Orfila, can be detected in any part of the alimentary canal, or its contents. Our author next comes to speak of the antidotes to lead when in large doses, and observes that the alkaline sulphurets which have been recommended, are totally inefficient, as the sulphuret of lead formed is an active poison; and recommends the sulphuric acid, or an alkaline or earthy

sulphate, especially that of magnesia, as a much more effectual substitute, since the sulphate of lead appears to be comparatively an inert substance. In the lead colic, however, it is obvious that the treatment must be very different, and M. Orfila enters at great length into the mode of treating this disease. But we must confess, that the specimen he has given of the practice pursued in this disease, in the hospital called *La Charité* in Paris, does not impress us with very favourable notions of the state of medical science in that metropolis. We do not think it necessary to notice all the remedies that have been proposed in this disease, most of which are detailed by our author. It of course must be left to the judgment of the physician to apply particular remedies to particular indications, but in general the chief indications appear to be, to abate the spasmodic action, and to excite the action of the intestines; and it is very probable that in most instances the first of these indications will be fulfilled by attending to the second alone. As a purgative, the *oleum ricini* has been found particularly beneficial, and lately the nitrate of silver, in conjunction with this oil, or subsequently to its use, has been strongly recommended by Dr. Roberts.*

In an *Appendix* to this volume, the author relates experiments made with the newly-discovered substance called *iodine*. This may be readily distinguished by the beautiful purple vapour it forms on being exposed to a moderate heat. He concludes that it ought to be ranked among the *corrosive* poisons, and states the following as the results of his experiments—that in small doses it acts as a slight stimulant, and induces vomiting; that in larger doses, when it is not ejected by vomiting, it slowly produces ulcerations in the mucous membrane of the stomach, and ultimately death; but that if ejected by vomiting, no bad effects follow; lastly, that it does not destroy life when applied externally.

He also relates experiments made with a view of ascertaining the efficacy of some alleged antidotes that had been lately recommended in cases of poisoning with oxymuriate of mercury and arsenic; these are charcoal in powder and the hydroguretted sulphuret of potash, the inefficacy of both of which

* See Medical Transactions of the College of Physicians, Vol. 5, p. 45.

especially of charcoal, he points out. He even shows that the sulphuret of potash is itself a poisonous substance, while most of the compounds of sulphur with poisonous metals have been stated to be so above.

Such are the contents of our author's first volume, which certainly will exhibit a lasting monument of his industry and labour; and if the results have not been so satisfactory as could be wished, still they are important, as he has undoubtedly thrown very considerable light upon the mode of action of some of the poisonous substances, as well as pointed out the efficacy of some unexpected substances, as antidotes. There is however, one fault which we think it our duty to mention. The author throughout has been a slave to method. Hence his work abounds with frivolous divisions and subdivisions, which, like so many "passages that lead to nothing," are not only useless, but often absurd. For besides the numerous tautologies which they occasion, they give an air of stiffness and formality to the book, which makes it very disagreeable to peruse, and which, we are convinced, will render it much less popular than it deserves to be.

We shall conclude this part of the subject, by recapitulating the more important general results in a tabular form.

POISONOUS SUBSTANCES.	ANTIDOTE, &c.
Oxymuriate of Mercury . . .	Albumen.
Arsenic	
Tartrate of Antimony and Potash	If vomiting cannot be induced, infusion of cinchona, or any other vegetable astringent infusion.
Verdigris and Sulphate of Copper	Sugar.
Muriate of Tin	Milk.
Sulphate of Zinc	Violent emetic. Vomiting to be encouraged by swallowing emollient liquids.
Nitrate of Silver	Solution of Muriate of Soda.
Muriate of Gold	
Nitrate of Bismuth	Milk and sweet mucilaginous liquids.
The Concentrated Acids . . .	Calcined Magnesia.
The Caustic Alkalies	Vinegar, diluted with much water.
Barytes and Muriate of Barytes .	The Alkaline Sulphates, or Sulphate of Magnesia.
Phosphorus	
Cantharides	
Acetate of Lead	The Alkaline Sulphates, or Sulphate of Magnesia.

The second volume of this interesting work, which we now come to consider, was published upwards of a year after the first, and has not been very long in this country. In it the author has completed the plan he had in view. It commences with an account of his THIRD CLASS, or what he denominates the

Acrid Poisons. We formerly mentioned, that from the arrangement adopted by M. Orfila, his account of the properties which the different substances classed together by him possess in common, is very imperfect. This is particularly the case with most of the classes in this volume, and especially with the present class. Our author defines the *acrid poisons* to be those substances "which have more or less of a caustic taste, and which, applied to the surface of the body, excite inflammation, often accompanied by blisters and the destruction of the cuticle, and terminating in suppuration. Introduced into the stomach, they produce local affections, *very analogous to the corrosive poisons, notwithstanding*," says our author, (evidently aware of the imperfections of the arrangement he has adopted) "*the opinions of many physiologists who have pretended to establish differences, founded upon the lesions which the organization presents after death.*"

The substances arranged by M. Orfila under this class, are chiefly taken from the vegetable kingdom. They are, *Veratrum album*, *Helleborus niger*, *Bryonia dioica*, *Momordica elaterium*, *Cucumis colocynthis*, *Gamboge*, or the gum resin obtained from the *Stalagmites cambogioides*, *Daphne gnidium*, *D. mezereum*, *Ricinus communis*, *Euphorbia officinarum*, *Juniperus sabina*, *Rhus radicans*, *R. toxicodendron*, *Anemone pulsatilla*, *Aconitum napellus*, *Chelidonium majus*, *Delphinium Staphysagria*, *Narcissus pseudonarcissus*, *Oenanthe crocata*, *Gratiola officinalis*, *Jatropha curcas*, *Scilla maritima*, *Sedum acre*, *Ranunculus acris*, *R. sceleratus*, *R. flammula*, *Rhododendron crysanthum*, *Fritilaria imperialis*, *Pedicularis palustris*, *Cyclamen Europæum*, *Plumbago Europæa*, *Colchicum autumnale*, *Convolvulus scammonea*, *Cerbera ahovai*, *Cynanthum erectum*, *Lobelia syphilitica*, *Apocynum androsæmifolium*, *A. cannabinum*, *A. venetum*, *Asclepias gigantea*, *Hydrocotile vulgaris*, *Clematitis vitalba*, *C. flammula*, *C. recta*, *C. integrifolia*, *Pastinaca sa-*

tiva, *Sœlanthus quadragonus*, *Phytolacca decandra*, *Croton tiglium*, *Arum maculatum*, *A. dracunculus*, *Adracontium*, *A. colocasia*, *A. esculentum*, *A. virginicum*, *A. arborescens*, *A. seguinum*, *Calla palustris*. From the mineral kingdom *Nitrate of Potash*, *Chlorine*, *Nitrous acid gas*, and *Sulphurous acid gas*.

Our author enters more or less upon the poisonous properties of this long list of substances, but our limits will not permit us to pursue him very closely. Indeed we despair of giving an account of the present volume, that shall be barely tolerable to the general reader. Consisting, as this work in general does, of a dry recital of cruel experiments upon poor animals, we even ourselves set about the task with disgust, and the general reader, who feels no particular interest in similar objects, had better perhaps abstain from M. Orfila's work altogether. But independently of this, the present volume necessarily consists of a series of details, which, in a review, there are only two modes of treating—either to pass them over altogether, or to enter more or less into them. For the sake of those of our readers who may feel interested in the subject, but who may not have leisure or opportunity of consulting the original, we shall prefer the latter mode; and with this view, shall give the conclusions drawn by our author from his experiments, upon some of the most important poisonous substances. But we think it our duty to warn our readers, that they will generally find these conclusions vague and unsatisfactory, and proving little more than that the different poisons destroy life in some unknown manner, by acting upon the nervous system.

In treating of individual poisonous substances, our author follows the same general plan formerly stated. When these substances are plants, he begins by relating their botanical and physical characters, and points out those parts of the plant in question which are usually employed. He then relates experiments and cases, illustrative of their poisonous effects upon the animal economy, and concludes with the general observations above alluded to.

Veratrum album, *White Hellebore*, and *Helleborus niger*. *Black Hellebore*. M. Orfila relates seven experiments made upon dogs with the first of these substances, in various manners and doses; and afterwards relates cases from Etmuller,

Schreder, Helmont, and others, demonstrative of its poisonous effects upon the human subject. He then relates the same number of similar experiments made with the *Helleborus niger*, in which he observed the effects which it produces upon the rectum, where the animal survived some hours, though the rest of the alimentary canal was not affected. From his experiments and observations he draws the following general conclusions respecting the operation of these poisons.

"1. That the pulverized roots of both black and white hellebore, applied to the cellular substance, are quickly absorbed, carried into the sanguiferous system, and produce violent vomitings, and many effects upon the nervous system which appear analogous to those produced by narcotics; and which soon destroy the animal.

"2. That they produce local inflammation when applied externally to the bodies of animals, but in too slight a degree to occasion immediate death.

"3. That their operation is similar when taken into the stomach, but in this case their effects are more slow and less intense.

"4. That if animals have the power of vomiting, death does not always take place. But when vomiting does not occur, death is constantly produced by a certain dose.

"5. That the root of the white is more active than that of the black hellebore.

"6. That the poisonous properties of the roots of both species of hellebore, reside in those principles which are soluble in water.

"7. That the alkaline extract, which forms a part of Bacher's tonic pills, is likewise very active."

The quantity of the powder of the roots of both these plants found by Mr. Orfila to prove fatal to dogs when taken into the stomach, was from two to three French drachms* (*gros:*) applied externally, 20 French grains of the white hellebore proved fatal. M. Orfila concludes his account of these poisons, by quoting instances from the London Chronicle, No.

* The French *gros* or drachm is 59.0703 grains Troy. Some of our contemporaries, in reviewing M. Orfila's work, *have mistaken the gros for the grain!*

1760, for the year 1768, and from the Oxford Magazine, for March 1779, to show the poisonous effects of another of this genus, the *fœtid Hellebore.*

Momordica elaterium. Wild cucumber. The prepared pulp of the fruit of this plant was employed. Our author relates experiments made upon dogs in his usual modes, all which proved fatal, and he concludes from these,

" 1. That the primary effects of elaterium depend upon the inflammation which it excites as much as upon its absorption.

" 2. That the cause of death induced by the administration or application of this substance, is the sympathetic affection of the nervous system.

" 3. That it acts in a particular manner upon the rectum."

About three French drachms were used by M. Orfila, in his experiments.

Cucumis colocynthis. Our author made, as usual, several experiments upon dogs with this substance. He also relates instances of its poisonous effects upon the human subject from different authors, and he concludes,

" 1. That the effects of colocynth depend chiefly upon its local action, and the sympathetic irritation produced in the nervous system.

" 2. That it is however absorbed, and carried into the sanguiferous system, upon which it directly acts, and also upon the rectum.

" 3. That both the soluble and insoluble portions of the poison are equally active.

" 4. That it appears to operate upon men in the same manner as upon dogs."

Three drachms and upwards of this substance were used by M. Orfila in his experiments. He supposes that this and other poisonous substances, which appear to act so violently on the stomach and rectum, without affecting the small intestines, produce these effects by the longer stay which they make in the extremities of the alimentary canal, than in the small intestines, through which he supposes they pass very rapidly. With regard to this explanation, we must confess that we do not think it sufficient to account for the phenomena, though we have not a better to offer.

Gamboge, the produce of the *Stalagmites cambogioides*. M. Orfila used from one to three or four drachms of this substance in his experiments, from which he concludes,

"1. That in dogs who retain the power of vomiting, a large dose of gamboge may be taken without proving fatal.

"2. That when vomiting cannot take place, death speedily follows its exhibition, which does not appear to depend upon its absorption, but upon the local energetic action which it exerts, and the sympathetic irritation of the nervous system.

"3. That it speedily destroys life when applied to the cellular substance, and that its effects are analogous to those of an extensive burn, in which an eschar is not produced."

Ricinus communis. The seeds of this plant contain its active principle. From thirty grains to three drams of these were used by M. Orfila in his experiments, from which he concludes, that besides the local irritation they produce, they are absorbed, and thus act upon the nervous system.

Euphorbia officinarum. Besides this species, our author made experiments upon the *E. lathysis*, and *E. cyparissias*. Of these, the last seems to possess least activity. From two drachms to half an ounce of the well-known product of the first species were used; of the second species, eight ounces of its juice; and of the third, five ounces of its juice were employed. He concludes from his experiment, and the observations of others,

"1. That euphorbium exerts a very powerful action, capable of producing acute inflammation.

"2. That its fatal effects arise more from a sympathetic affection of the nervous system than upon absorption.

"3. That it appears to act in the same manner upon men as dogs."

Most of the other species of euphorbia are poisonous.

Juniperus sabina. M. Orfila made three experiments with the leaves of this plant, in doses of two to six drachms, all which proved fatal; and he concludes that it exerts a very powerful local action, but that its effects chiefly depend upon its being absorbed, and thus acting upon the nervous system, the stomach and the rectum.

Rhus radicans et R. toxicodendron. Our author seems to

adopt the opinion of M. Bosc,* that the *R. radicans* is not a distinct species, but only a variety of the *R. toxicodendron.* He concludes from his own observations, and those of others,

"1. That the most active part, both of the *R. radicans* and *R. toxicodendron*, is disengaged in a gaseous state, while it is excluded from the direct rays of the sun.

"2. That it acts like the acrid poisons.

"3. That the aqueous extract, both internally and externally applied, produces local irritation, followed by more or less inflammation, and exerts a stupifying effect on the nervous system, after being absorbed.

"4. That its action is similar when injected into the jugular vein."

The first of these conclusions is drawn chiefly from the observation of Van Mons, who has endeavoured to show, that the deleterious effects of the fresh plant depend more upon a peculiar poisonous principle which is exhaled in solution in carburetted hydrogen gas, by the plant during the night, and in the shade, than upon its juice.† The speculations of Van Mons should be received with caution.

Another species of this genus, the *R. vernix*, is said by M. Orfila, to possess similar properties.

Aconitum Napellus. Wolf's-bane. Our author's first experiments were made with the extract of this plant procured from different druggists, in doses of from eighteen grains to two drachms. These extracts were made in the usual manner by exposure to great heat. He afterwards made some experiments with an extract made upon a water bath, which were much more active, and he has taken this opportunity of offering some judicious remarks upon the propriety of preparing all vegetable extracts in this manner. From his own experiments, and those of many others which he notices, he concludes,

"1. That the juice of the leaves of the aconite, introduced into the stomach or rectum, or injected into the cellular substance of dogs, excites destructive effects, speedily followed by death.

* See Actes de la Societé de Médécine de Bruxelles.

† See Idem.

"2. 3. 4. That the root of the plant appears more active than the juice of the leaves; and that the watery extract, prepared with the expressed juice of the recent plant, possesses nearly the same poisonous properties as the juice itself; but that it is considerably less active, if prepared by decoction; and that the resinous extract is more active than the watery.

"5. 6. That the different preparations are absorbed, and carried into the circulation, where they act upon the nervous system, especially the brain, producing a sort of mental alienation; and that they also excite a local irritation, terminating, more or less, in inflammation.

"7. That they seem to produce the same effects upon men as dogs."

Instances are quoted by our author, to prove that other species of this genus, as the *A. Cammarum*, *A. Anthora*, and the *A. Lycoctonum*, are poisonous.

Delphinium Staphysagria. Stavesacre. An ounce of the powdered seeds of this plant taken internally, proved speedily fatal to a dog; and so small a quantity as two drachms applied externally had the same effect. M. Orfila's conclusions respecting this plant are,

"1. 2. That it is not absorbed; but its deleterious effects arise from the local irritation it produces, and a sympathetic action of the nervous system. That the part soluble in water is the most active, and that its local effects are stronger when it is moistened before it is applied to the cellular substance."

In a note we are informed, that the brain was examined in most of the before-mentioned instances, when affections of the nervous system appeared, but that no derangement of this organ was visible.

Oenanthe crocata. Hemlock dropwort. So many instances on record demonstrate the poisonous properties of this plant, and which are quoted by M. Orfila, that he did not think it necessary to institute experiments with it. From these observations, therefore, he draws the vague conclusions, that this plant excites a strong local irritation, and acts powerfully upon the nervous system. Two instances are also noticed of the poisonous nature of another of this genus, the *Oe. fistulosa.*

Gratiola officinalis. Hedge Hyssop. The quantity of the wa-

tery extract of this plant, used by M. Orfila, was about three drachms. But so small a quantity as twenty-eight grains, injected into the jugular vein, proved fatal. The conclusions are,

" 1. That this extract produces a severe local irritation.

" 2. 3. That it is not absorbed; but that its effects depend upon the sympathetic affection of the brain, and that it is much more active when injected into the veins."

Jatropha curcas. From one to three drams of the seeds of this plant, deprived of their external coverings, and beat into a paste, were employed; the results were,

" 1. 2. That they possess very powerful poisonous properties. That they are not absorbed, but their deleterious effects depend on the severe inflammation which they induce, and their sympathetic action on the nervous system.

" 3. That they act more violently when introduced into the stomach than when applied to the cellular substance."

The poisonous properties of two others of this species are also noticed, namely the *J. manihot*, and the *J. multifida.*

Scilla maritima. The Squill. Mr. Orfila's experiments were made from 36 grs. to 2 drachms of the dry powder, and with about two ounces of the recent root; and he concludes from them,

" 1. 2. That its fatal effects depend principally upon its absorption, and the action it exerts on the nervous system. That the lungs are not disorganized, but that the quickened respiration depends upon nervous influence.

" 3. 4. That local irritation is, however, excited, which is more energetic as death is longer in taking place; and that it often excites nausea and vomiting."

Ranunculus acris. Meadow crowfoot. this, as well as most of the other species of this genus, are active poisons. M. Orfila particularly mentions the *R. sceleratus* and the *R. flammula*, he observes that the *R. bulbosus*, *R. ficaria*, *R. thora*, *R. arvensis*, *R. alpestris*, *R. polyanthemos*, *R. illyricus*, *R. gramineus*, *R. asiaticus*, *R. aquatilis*, *R. platonifolius*, *R. breynius*, and *R. sardous*, are equally poisonous. The conclusions are,

" 1. 2. 3. That these different species of ranunculus and their extracts produce acute inflammation of the parts to which they are applied; but that their fatal effects depend upon the

sympathetic action upon the nervous system; that they do not appear to be absorbed."

The remaining poisons from the vegetable kingdom above enumerated, and which are classed together under the name of *acrid*, are very briefly treated of by our author; we shall only, therefore, notice one or two of the chief.

Colchicum autumnale. Meadow Saffron. Concerning this plant, which has lately attracted a good deal of notice from its being supposed to be the basis of the *eau medicinale*, various opinions have been held, and are quoted by our author. From his own experiments one would hardly suppose it to be poisonous, as he informs us that he gave in the month of June two or three of the fresh roots bruised, without any sensible effects. Others, however, maintain that it is capable of acting as a violent poison by inducing vomiting, &c. with inflammation of the stomach and death. Our author endeavours to reconcile these accounts by supposing that the properties of the plant vary with the climate and season.

Arum maculatum. The root of this plant was found by M. Orfila to prove fatal to dogs, and a case is related from Bulliard where two out of three children who had eaten of the leaves died, and the third had a narrow escape.

After the vegetable poisons ranked by our author in this class, he proceeds to consider those of the mineral kingdom, which he supposes to act in a similar manner, and the first on the list is the

Nitrate of Potash. There are many instances on record of the fatal effects produced by this salt, when taken in considerable doses. Some of these are enumerated by our author, and from these and from experiments made by him on dogs, he concludes,

"1. That nitrate of potash taken into the stomachs of dogs or of men, acts like the acrid or corrosive poisons.

"2. That when vomiting does not take place, it is capable of producing death in doses of two or three drachms.

"3. That it appears to act immediately upon the mucous membrane of the alimentary canal, and afterwards upon the nervous system, producing a stupifying effect.

"4. 5. That it is not absorbed when applied to the cellular

substance, and consequently in this case produces only local effects. That the opinion of M. Tourtelle, a physician at Besançon, who supposes that this salt acts like other neutral salts, cannot be admitted."

Chlorine. This gas, according to M. Nysten, whose opinion is adopted by M. Orfila, is not absorbed when respired, but destroys life by its powerful action upon the organs of respiration. When in solution in water it acts like the other mineral acids.

Nitrous Acid Gas. Our author quotes a case in which the inspiration of this gas proved fatal. He supposes its fatal effects to depend partly upon its destructive operation upon the organs of respiration, and partly upon the change which it induces in the blood, which he considers as analogous to that produced by nitrous gas. When in solution in water, its effects are similar to those of nitric acid.

Sulphurous Acid Gas. The fumes of burning sulphur. This gas is capable of producing death when respired by its irritating effects upon the lungs. M. Orfila does not notice its effects upon the blood.

After this detailed account, our author takes a general survey of the symptoms produced by this class of poisons, of their action upon the animal economy, and of the mode of treatment to be adopted in cases of poisoning by them. We shall briefly notice what he has advanced on each of these subjects.

Some time after the poisonous substance has been administered, there is a sensation of an acrid, sharp, and more or less bitter taste in the mouth, and the mouth and tongue are hot and dry, and there is a painful sense of constriction in the throat. These are soon succeeded by acute pains in the stomach and bowels, which are followed by nausea, and generally abundant evacuations both upwards and downwards. These evacuations sometimes take place without effort, but generally they are excessively painful, and proceed till the whole contents of the alimentary canal are evacuated. The pulse is strong, frequent, and pretty regular. Respiration is somewhat quickened, and there is a perceptible change in the sensation and movements of the animal. Some hours after this, symptoms of derangement in the nervous system take place. The animal

waiks unsteadily. The pupils of the eyes are dilated, and he falls into a state of great insensibility. Respiration and circulation become languid, and he sinks without uttering the least cry. Sometimes, however, convulsions, more or less violent, take place, the extremities become stiff, and he dies uttering plaintive cries.

Our limits will not permit us to enter minutely into the effects produced and observable after death. Generally, the mouth, stomach, and intestinal canal, are found inflamed, the lungs also are affected in a similar manner, and the heart is commonly gorged with blood. The brain and its membranes are not sensibly affected. When the poison has been externally applied, all these appearances are observable, except that the stomach and alimentary canal are seldom affected. Our author's general conclusions from his observations are,

"1. That in a case of poisoning the physician will be greatly puzzled to discover, from the mere appearance found after death, if the poisonous substance belonged to the class of *corrosive* or *acrid* poisons.

"2. That even if the class to which the poison belongs be discovered by other means, yet it cannot be decided from the appearances found after death, *what particular* poison has been taken, the effects produced by the whole class being nearly the same.

"3. That it can, however, be generally ascertained by attending to the degree of inflammation found after death, that the poison has not belonged to the narcotic or narcotico-acrid classes, as these produce very slight inflammation."

In his observations upon the action of these poisons upon the animal economy, our author points out the very different manner in which the different substances he has classed together operate, and he candidly acknowledges the imperfection of the classification he has adopted, and the great difficulty of forming one upon similar principles free from objections. For example, he observes that some of the poisons of this class chiefly act locally, and produce death by sympathetically affecting the nervous system. Such are the Garou, the Jatropa curcas, &c. Others, besides producing local effects, are absorbed, as colocynth, savine, &c. Others produce comparatively slight local

effects, but are rapidly absorbed, and taken into the sanguiferous system, thus producing their deleterious effects, as the black and white hellebore, &c. Lastly, others are rapidly absorbed, and exert their effects at once upon the nervous system, as the aconite. Our author concludes this section by some good observations upon the circumstances upon which an opinion respecting absorption or non-absorption of a poison is to be formed.

"Does there exist any antidote to the acrid poisons?" In reply to this question, which our author as usual proposes to himself, he remarks, that in the common acceptation of the word there is no antidote to these poisons, most of them being organized substances, with the chemical properties of which we are unacquainted. He recommends, that when the poisonous substance is one of those which excite acute inflammation, &c. that the antiphlogistic treatment should be adopted, vomiting having been previously encouraged by tepid mucilaginous diluents, and even cold water. All irritating means, as emetics, vinegar, &c. should be avoided. To moderate excessive vomiting he recommends laudanum. If the poison be one of those that acts chiefly upon the nervous system, he recommends an infusion of coffee, and small doses of camphor; and if these be rejected, clysters, frictions, and demulcent drinks, are ordered. If vomiting does not spontaneously occur, our author recommends the exhibition of an emetic. If, instead of coma, there be high excitement of the nervous system, opiates and other means to diminish this must be had recourse to. And in general "we may," says our author, "reduce all that is to be done in these cases to the two following rules. 1. When the poison does not produce evacuations, to have recourse to copious dilution with mucilaginous drinks. 2. To observe particularly the secondary symptoms, and to combat them by appropriate means, which, of course, must vary with the nature of the injury."

Class IV. *Narcotic Poisons.* M. Orfila terms these poisons *Narcotic*, which "are rapidly absorbed and occasion stupor, drowsiness, palsy, or apoplexy, and convulsive motions." under this head are ranked *Opium*, *Hyosciamus niger*, *H. albus*, *Prussic acid*, *Prunus lauro-cerasus*, *Bitter almonds*, *Lac-*

tuca virosa, *Solanum nigrum*, *S. fuscatum*, &c., *Taxus baccata*, *Actæa spicata*, *Physalis somnifera*, *Azalea Pontica*, *Ervum ervilia*, *Lathyrus cycera*, *Peganum harmela*, *Paris quadrifolia*, *Saffron*, and *Azotic gas* and its compounds. Our author is very brief on many of these, and we shall only notice some of the more important.

Opium. M. Orfila begins, as usual, by describing the physical and chemical properties of this important substance. The latter he adopts from M. Derosne, who states the constituents of opium to be, 1. a crystallizable substance; 2. extractive matter; 3. resin; 4. oil; 5. an acid; 6. some fecula; 7. mucilage; 8. gluten; 9. vegetable fibres, which, with occasionally a little sand, &c., are extraneous.

Our author, as usual, instituted a number of experiments upon dogs with this drug, both in its crude state, in the form of an aqueous extract, &c., and he concludes from these, and the observations of others, with M. Nysten,

"1. That an extract prepared with cold water, and evaporated only once, is more active than the other products of opium, without excepting the gummy extract of Cornel, Baume, and Rousseau, prepared by repeated evaporations, long digestion, or by fermentation.

"2. The resinous matter, which is little soluble, produces similar effects to the aqueous extract, but requires to be given in a larger dose, and it does not inflame the mucous membrane of the stomach. If inflammation of this organ has been observed in a case of poisoning with opium, it must therefore be ascribed to the spirituous menstruum in which it had been taken, or some other irritating substance given as an antidote.

"3. The crystallizable principle of opium, which has been improperly termed the *narcotic principle*, is still less active than the resin. M. Nysten swallowed four grains of it, and only experienced a slight disposition to sleep.

"4. The pellicle which separates during the evaporation, acts less powerfully than the crystallizable principle.

"5. The distilled water of opium, strongly impregnated with the aromatic principle, induces intoxication, and sleep in a larger dose. M. Nysten swallowed two ounces of it without experiencing any sensible effect.

"6. Three or four grains of the watery extract of opium injected into the carotid of a dog, kill it in a few minutes.

"7, 8. A little larger dose is necessary to produce a similar effect when it is injected into the crural or jugular vein. Injected into the pleura or peritoneum, it likewise proves fatal. Injected into the cellular substance, the fatal effects of opium are much less speedy and energetic.

"9. The effects take place equally when the watery extract is injected into the bladder, but a large quantity is necessary to produce death.

"10. The application of opium to the brain, does not prove fatal, although it is by its peculiar action on this organ, that opium taken into the constitution, produces dangerous symptoms.

"11. Opium does not destroy the contractile power of the muscles to which it is applied, and the symptoms of poisoning which occur in this case, depend upon its absorption and action upon the brain. A heart plunged into a solution of opium, continues to contract in it for a very considerable time.

"12. The supposed analogy between the action of wine and opium is incorrect. Opium, be the dose small or large, instantly diminishes the vital powers, and it is from this property that it acts as a sedative. Wine, on the contrary, always restores those powers, and even where it debilitates, this is in consequence of the previous great excitement which it has induced.

"13. Opium does not produce death by acting upon the extremities of the nerves of the stomach, as has been supposed; for animals having the *par vagum* divided on both sides, die in two or three hours, after experiencing the usual symptoms, intoxication, somnolency, and convulsions."

Our author considers the much agitated question, whether opium acts as a sedative or stimulant, and he quotes a long list of advocates for both sides of the question. He dissents, however, from both these opinions, and concludes, from his own observations,

"*A.* That opium employed in a strong dose, cannot be arranged either with narcotics or stimulants, but it exerts a pe-

culiar action, which cannot be exactly designated by any term employed in the *materia medica.*

"*B.* That employed in a small dose, it chiefly acts by producing stupefaction, but that sometimes, from idiosyncrasy, it produces a great degree of excitement.

"*C.* That no analogy exists between the action of opium and spirituous liquors in large doses."

The nature of the action of opium, after all the poor animals that have been sacrificed, and all that has been said on the subject, appears to us to be as little understood as ever; for with all deference to our pains-taking author, we cannot discover that he has thrown the least light upon the subject.

Hyosciamus niger. Henbane. Most of this genus appear to possess poisonous properties. M. Orfila made no less than sixteen experiments with the *H. niger*, and from these and various histories which he quotes, he concludes,

"1, 2. That the juice and decoction of the root of henbane in full vegetation, produce fatal effects when introduced into the stomach, but that in the spring the effects of this plant are less powerful; and that the juice of the leaves is less active.

"3. That the aqueous extract, prepared by evaporating the juice of the recent full blown plant in a water bath, possesses nearly the same effects as the juice itself; but that an extract prepared from a decoction of the plant not completely developed or over dried, is much less active; a fact which explains why the extract of commerce generally possesses little or no virtue.

"4, 5. That the preparations of this plant act nearly in the same manner, whether they be applied to the cellular substance, or taken into the stomach or injected into the veins. In the last of which cases, a very small quantity proves fatal. In each case they are absorbed, carried into the circulation, and produce a remarkable effect upon the nervous system, which may be compared to mental alienation, and to which succeeds deep stupor.

"6, 7. That they do not inflame the stomach, and that they apparently act in the same manner upon the human subject as upon dogs."

The Prussic acid. This acid, as lately obtained by Gay Lu-

sac in its most concentrated form, is a colourless transparent fluid, so exceedingly volatile, that, on being exposed to the air, it congeals by the cold which it produces by its own evaporation.* Its sensible properties are strongly marked, and it has been shown that the poisonous properties of the essential oil and distilled water of the *Prunus lauro-cerasus*, and bitter almonds, owe their deleterious properties to this acid. Hence M. Orfila treats of these different substances under the same head. He concludes from his experiments,

"1. That the Prussic acid proves fatal to the different classes of animals, but particularly to the warm blooded. Insects die in it as speedily as the warm blooded animals, but they differ from the warm blooded animals by the inverse order in which their parts die. 2. That death is induced more speedily in proportion to the rapidity of the circulation, and as the organs of respiration are more extended. 3. That it is most destructive to young animals. 4. That it acts upon every tissue with which it comes in contact, except the nerves and *dura mater*. 5. That it varies in the intensity of its action according to the part to which it was applied. For example, it is very deleterious when injected into the jugular vein, or trachea, less so when injected into the thorax, and still less when injected into the stomach or rectum. Applied to wounds, its action is much less still, but death takes place more speedily when the wounds are situated in the anterior extremities (Emmert.) 6. That if the dose be not strong enough to induce death, the animal very generally revives. 7. That its effects depend upon its being absorbed and carried into the course of the circulation. 8. That its action is slow, but not suspended when it is placed in contact with a part, the communication of which with the brain or spinal marrow is cut off. 9. That it operates upon man the same as upon other warm blooded animals. 10. That it destroys irritability, and ought to be ranged with the narcotic poisons. 11. That it does not produce any inflammatory action capable of being observed after death. But that the venous system appears full of blood, whilst the arterial is empty; the pupils often dilated, and the lungs spotted—effects common to a great number of the stupifying poisons."

* Annales de Chimie, t. 77, p. 128.

The distilled water and oil of the laurel and bitter almonds, act, according to M. Orfila, in a similar manner, but the watery extract of the laurel is little poisonous, from the volatilization of the Prussic acid.

Lactuca virosa. Strong scented lettuce. This does not appear from M. Orfila's experiments to be a very active poison, though its watery extract, either applied to a wound or taken internally, sooner or later proved fatal.

Solana. Different species of nightshade. According to Dunal, whom our author quotes, none of this genus prove very active poisons. He found, however, that the extract of the *solanum nigrum* is slowly absorbed, and destroys the sensibility and mobility of the muscles. Many of this genus, according to Dunal, have the property of dilating the pupil, and rendering the eye insensible to light, in a manner similar to the *belladonna*, but in a less degree.

None of the other plants above enumerated, possess either very active or remarkable poisonous properties.

Azotic gas and its compounds all prove fatal sooner or later when inhaled. M. Orfila quotes an experiment from Nysten, in which azotic gas was injected into the jugular vein, and in which it appeared to influence the heart, and produce a sedative effect. He then proceeds to quote the experiments of Davy, Proust, Psaff, and others, with the nitrous oxide, which produced upon himself very unpleasant effects, such as vertigo, great uneasiness and burning heat in the chest, which terminated in syncope, that lasted six minutes; and the experiments of Nysten, afterwards quoted by our author, seemed to show, that nearly similar effects are produced when this gas is injected into the blood vessels of an animal.

Our author next proceeds to consider the general effects produced by this class of poisons. These, as usual, are subject to all the defects we formerly noticed. We shall, however, give them in his own words.

"Stupor, dulness, heaviness of the head. A desire to sleep, which at length cannot be overcome; vertigo, a sort of intoxication, delirium, furious or lively, sometimes pain. Convulsions more or less strong over the whole body; paralysis of the posterior extremities, dilatation of the pupil, diminished

sensibility of the organs of sense, as in apoplexy, pulse frequent, or slow, and at first generally full and strong. Respiration little affected, but sometimes a little quicker than natural, nausea and vomiting, especially when the poison has been applied to the cellular tissue, or injected into the rectum. The affections of the nervous system increase, and at length the animal dies. Death very speedily takes place when the poison has been injected into the veins, less speedily when it has been applied to the cellular tissue, and slowest of all when it has been taken into the stomach."

After death the alimentary canal is stated by M. Orfila to be found little affected by these poisons, and they seem to act, when applied externally, little more than any other foreign substance. The lungs are frequently affected in the same manner as with the acrid poisons. The blood contained in the heart and veins, is frequently coagulated soon after death. The veins of the brain and its membranes, frequently present the appearance of being gorged with blood, but the injuries of the other organs are not appreciable.

Our author next inquires into the mode of treating cases of poisoning by the different substances of this class. He enumerates these means in the following manner: 1. Vinegar, and the vegetable acids. 2. The infusion and decoction of coffee. 3. The solution of chlorine in water (oxymuriatic acid.) 4. Camphor. 5. Water, and emollient fluids; and 6. Blood-letting.

1. Of vinegar and the vegetable acids. Our author concludes, from a great number of experiments, that these, so far from being antidotes to opium, always aggravate its effects, when taken before the animal has vomited. This aggravation appears to depend upon the inflammation of the stomach, which these acids produce when conjoined with opium. On the contrary, when the poisonous substances have been ejected by vomiting, the vegetable acids have the property of diminishing the symptoms of the poison, and even altogether overcoming them. 2. Coffee. Our author's experiments induce him to conclude, that coffee does not, like vinegar, increase the effects of the poison, but that a well prepared infusion taken in frequently repeated doses, rapidly diminishes the

effects of poisoning by opium, and may even completely overcome them. 3. Chlorine. This cannot be administered of that degree of strength necessary to decompose the opium, without producing dangerous consequences, and in its dilute state it acts like vinegar, and has no particular advantages over that acid. 4. Camphor. M. Orfila concludes from his experiments with this alleged antidote, that it neither decomposes opium, nor prevents its action as a poison. 5. Water and mucilaginous drinks in general. Our author was induced to try the effects of these antidotes from their having been lately recommended by M. Porta; but he concludes from his experiments, that water is more likely to prove dangerous than useful, by dissolving the opium, especially when acidulated, and thus facilitating its absorption. 6. Blood-letting. M. Orfila's conclusions respecting this remedy are, That it may be useful, especially in the plethoric, and he recommends the jugular vein to be opened in preference.

The means to be adopted, therefore, in cases of poisoning by opium, are, according to our author, in the first place to produce full vomiting, either by the sulphate of zinc or copper, or by *injecting a solution of tartar emetic into the veins* (we doubt if any one will be found hardy enough to perform this latter operation,) and thus, if possible, to expel the poison from the stomach. The emetic substances should not be dissolved in a large proportion of water, nor the stomach filled with mucilaginous, acid, or even aqueous drinks, for the reasons above mentioned. After the opium has been expelled, the jugular vein may be opened, and more or less blood be abstracted, according to the constitution of the patient. Water, acidulated with the vegetable acids, may now be administered alternately with coffee; these should be given in small quantities, and repeated every ten minutes. Camphor injections may be now had recourse to; or, if the opium has descended into the large intestines, purgative clysters may be employed with advantage.

Most of our author's observations have been made on dogs; and, as some objection may be made to his conclusions from this circumstance, he gives it as his opinion, drawn from upwards of TWO THOUSAND experiments made upon these poor

animals; that the nature of the symptoms produced by poisons, and the means of counteracting them, are the same as those in the human subject; and that the only difference is in the quantity necessary to produce the same effect, and in the relative moral and physical powers of the animals.

The same means are recommended in cases of poisoning with henbane, and the other vegetable narcotics; but for the Prussic acid, and substances containing it, the oil of turpentine, and other stimulants are recommended, on the authority of Emmert, after a powerful emetic has been administered.

Class V. *Narcotico-acrid poisons.* This class is intended to include those substances which have an acrid nauseous taste, and which act, at the same time, as narcotics and rubefacients; but our author justly observes, that the name, in many instances, is very inapplicable. Indeed, it appears to us astonishing, how M. Orfila, aware as he evidently is of the imperfections of the classification he has adopted, could have chosen it.

Under this class are included, *Atropa Belladonna*, *Datura Stramonium*, *Tobacco*, *Digitalis*, *Anagallis arvensis*, *Aristolochia*, *Conium Maculatum*, *Cicuta virosa*, *Œthusa cynapium*, *Ruta graveolens*, *Nerium oleander*, *Upas tieuté*, *Strychnos nux vomica*, *Faba Sti. Ignatii*, *Angustura Pseudo-ferruginæa*, *Upas-antiar*, *Ticunas*, *Woorara*, *Camphor*, *Menispermum cocculus*, *Fungi*, as the *Agaricus muscarius*, *A. bulbosus*, *A. conicus*, &c. &c. Also *Alcohol*, *Ether*, *Carbonic acid gas*, *Carbonic oxide*, *Carburetted hydrogen*, &c.

Atropa belladonna. M. Orfila concludes from his own experiments, and the observations of others,

"1. That *belladonna* and its extract possess very energetic poisonous properties.

"2, 3. That their local action is not powerful, but that they are absorbed, and thus carried into the course of the circulation, and act upon the nervous system, especially the brain; and that the symptoms they produce do not differ sensibly from those produced by many other poisons, as some have supposed.

"4. That the most active extracts are those prepared by evaporating at a low temperature, the juice of the fresh plant.

"5. 6. That their action is more intense when injected into the veins, than when they are externally applied, or particularly when they are taken into the stomach; and that they act the same upon men as upon dogs."

The quantity used by M. Orfila in his experiments, was from a few grains to half an ounce.

Datura Stramonium. This, as well as some others of the genus *Datura*, as the *D. metela*, the *D. tatula*, and *D. Ferox*, are all stated by our author, either from his own observations, or those of others, to be poisonous, and to produce nearly the same effects as *belladonna*, only that the *D. Stramonium* seems to act more powerfully upon the brain. The dried stem and leaves of this plant have been lately much used in this country for smoking; but its effects are sometimes in this way very powerful, and even alarming.

Tobacco. Our author, besides his own experiments, details those of Mr. Brodie and others, among which are some communicated to him, by Dr. Macartney, of Dublin; from these he concludes,

"1. 2. That the leaves of tobacco, either entire or in a state of powder, as usually sold, possess active poisonous properties; and that their active principle appears to be dissolved in water, and absorbed and carried into the course of the circulation.

"3. 4. 5. That they appear to act chiefly on the nervous system, and produce a general tremor, such as is rarely produced by other poisonous substances; that their action is more powerful when the solution of their active principle is injected into the anus, than when applied to the cellular substance, and especially than when introduced into the stomach; and that, independently of these phenomena, they are capable of acting locally, and producing more or less of inflammation.

"6. That they appear to act in the same manner upon men as upon dogs.

"7. That the empyreumatic oil does not act immediately upon the brain and nerves, but that it operates upon the nervous system in a manner which it is not at present easy to explain.

"8. That the extract of the *nicotiana rustica* operates in a similar manner to tobacco, but is less active."

Digitalis purpurea. Foxglove. An analysis of this active plant has been made by M. Bidault de Villiers, which is given by our author; but as it throws no light on the nature of its poison, we do not think it worth while to notice it. His conclusions from his numerous experiments, and the observations of others, are,

"1. 2. That the powder, the watery and resinous extracts, and the tincture, in certain doses, are to be regarded as energetic poisons, but the resinous extract is more active than the aqueous, and the aqueous than the powdered plant.

"3. That the resinous extract acts strongly and speedily when injected into the jugular vein; that it is less active when applied to the cellular substance, and still much less so when introduced into the stomach, notwithstanding vomiting be prevented.

"4. 5. That all these preparations operate in the first place as emetics, that their effects upon the circulation vary in different individuals. Sometimes no change can be observed in the functions of the system: sometimes the pulse is rendered more slow, but quite as often it is accelerated, and becomes strong, unequal, and intermittent.

"6. That the resinous extract appears to act more especially upon the heart or the blood, as this fluid is instantly found coagulated immediately after death, when the extract has been applied to the cellular substance, or introduced into the stomach.

"7. 8. 9. That independently of these phenomena, this plant and its preparations act upon the brain, after having been absorbed, and produce a sort of instantaneous stupefaction, which is speedily followed by death. That the plant in powder is capable of exciting considerable local inflammation; and lastly, there is every reason to believe that this plant acts upon men in the same manner as upon dogs."

M. Orfila states, in a note, that he has taken daily from four to twenty grains of this plant in a state of powder, for a month, without producing any effect upon the pulse: hence he seems to doubt the opinion commonly maintained respecting

the properties of this plant. Had he made his experiments with the resinous extract instead of the powder, which he acknowledges is the most inefficient of all its preparations, and at the same time the most liable to be injured by the preparation or by being kept, his results would have been more satisfactory.

Conium maculatum and Cicuta virosa. Hemlock, and water hemlock. Our author's conclusions from his experiments, and the observations of others, respecting these plants, which appear to operate similarly, but in different degrees, the *C. virosa* being most active, are

"1. 2. That the fresh leaves furnish at a certain period a juice which acts as a powerful poison, but the juice of the roots obtained at the same time is less active. That the aqueous extract prepared upon a water bath, retains most of the properties of the plant; but that it is less active, and sometimes almost inert, when prepared by boiling the dry powder in water, and evaporating the decoction at a high temperature.

"3. That the different preparations of this plant act more rapidly and strongly when injected into the jugular vein than when applied to the cellular substance, or taken into the stomach.

"4. 5. That they are absorbed, carried into the circulation, and act upon the nervous system, especially the brain; and, lastly, that they excite also a local inflammation."

The next poisonous substances which are mentioned by M. Orfila, and which we think it important to notice, are the *Upas tieuté*, the *nux vomica*, and the *faba Sancti Ignatii*, all which he considers as belonging to the genus *strychnos*. The *Upas tieuté* has generally been confounded by authors with the *Upas antiar*, but the former is the production of a sarmentitious plant, the latter of a tree. M. Orfila details the results of seventeen experiments made with the *Upas tieuté*, of fifteen with the *nux vomica*, and of two with the *faba Sancti Ignatii*, besides many observations from others; and he concludes,

"1. These three substances act as very energetic poisons upon a great number of animals, and also on man.

"2. That they may be regarded as exciting the spinal marrow, upon which they appear to act by producing tetanus, im-

mobility of the thorax, and consequently asphyxia, which proves fatal to the animal.

"3. 4. To whatever part of the surface of the body they are applied, they are absorbed, carried into the course of the circulation, and appear to operate, as M. Majendie first observed, through the medium of the veins.* They act very speedily when injected into the pleura, the peritoneum, or jugular vein, more slowly when applied externally, or injected into the arteries distant from the heart, and their effects are still more slowly manifested when they are applied to mucous surfaces.

"5. They produce no effect when the spinal marrow is elevated by a slip of whalebone.

"6. The watery extract of the *nux vomica* and *St. Ignatius's bean*, are more active than the powders of the seeds, but less so than the resinous extracts.

"7. None of these poisons excite local inflammation in the parts to which they are applied."

Angustura Pseudo-Ferruginæa. Humboldt has given this name to the bark known among the French druggists by the denomination of *Angusture fine*, and which he supposes to be the production of a tree belonging to the genus *bonplandia*, another species of which, the *bifoliata*, according to the same learned traveller, yields the true *angustura bark* (*cusparia cortex*) of our Pharmacopœia. According to our author's experiments, and the observations of Emmert, it possesses very powerful poisonous properties, the effects of which are similar to the genus *strychnos* abovementioned, and chiefly reside in a yellow bitter matter which it contains.

Upas-Antiar. This is a yellowish, milky, and bitter juice, which exudes from the tree. M. Orfila repeated the experiments of Majendie and Delile, who in 1809 read a Memoir to the Institute on this poison. His conclusions from them are—

"1. That the *upas-antiar* is very poisonous when it is injected into the carotid artery, the cerebral pulp, or the jugular vein; that it is less so when injected into the pleura, still less when applied to the cellular substance, and least of all when introduced into the stomach.

* See his Memoire sur l'Absorption.

"2. 3. That it is absorbed and carried into the course of the circulation, and acts upon the brain and spinal marrow, which are shown by the loss of sensibility, the severe cries, by the contortion of the head, and by the drawing of the muscles of the face; and, lastly, that it acts as an emetic."

From four to twenty drops were used by M. Orfila in his experiments. Mr. Brodie and Emmert think this poison acts upon the heart, but our author, who quotes them, makes no remark upon this opinion.

Ticunas, or the *American poison.* M. Orfila quotes M. Condamine's account of the composition of this poison, according to whom it is a very compound substance. He does not appear to have made any experiments upon it himself, but draws his conclusions respecting it from those made by Fontana.

Woorara. This poison strongly resembles the last, and is used by the Indians of Guyana for a similar purpose, namely, the poisoning of their arrows. Our author merely quotes the experiments and conclusions of Mr. Brodie respecting it.

Camphor. Our author made many experiments, and quotes several authors, with the view of throwing light upon the nature of the action of this substance. The results, however, do not seem very satisfactory, further than they appear to show that this principle acts in some manner upon the brain and nervous system, and is capable of exciting local inflammation. What is singular, artificial camphor appears to exert no similar action upon the nervous system, but its effects are merely local.

Menispermum Coculus. Coque du Levant. M. Goupil's experiments on this poisonous substance, quoted by M. Orfila, show that it is not only a poison to fishes, but also other animals, and probably man. The kernel of the seed contains the poison, and the flesh of fishes which have been poisoned with it, is likewise highly poisonous. M. Orfila concludes from his own experiments that its action is very similar to that of camphor. The poisonous principle is crystallized, and has been called by M. Bouillay *picrotoxine.*

The poisonous Fungi. Our author enters at considerable length into the description of these poisonous plants, and

quotes likewise many examples of their poisonous effects. He seems, however, to have made few, if any, experiments with them himself, and he draws no conclusion respecting their mode of action.

Alcohol. M. Orfila's conclusions from his own experiments and the observations of others, respecting the action of this fluid, are—

"1. That alcohol operates upon dogs, cats, and rabbits, the same as upon man.

"2. 3. 4. That it acts more energetically when taken into the stomach, than when injected into the cellular substance; but that it is most active when injected into the jugular vein. That its action commences by first exciting the brain, to which excitation coma and insensibility succeed. That its first effects result from the action which it exerts upon the extremities of the nerves, and which is propagated to the brain, but that it is nevertheless at length absorbed.

"5. That there is no identity, as has been pretended, between the action of alcohol and opium. A. Opium does not act till it is absorbed, and is much more active when injected into the cellular substance of the thigh, than when introduced into the stomach, because it is more quickly absorbed. Alcohol, on the contrary, as it acts upon the extremities of the nerves, produces its effects more rapidly when introduced into the stomach, than when applied to the cellular substance of the thigh. B. Alcohol uniformly produces an increased degree of excitement in men and dogs, of various duration, to which succeed coma and great insensibility. Opium, on the contrary, first produces drowsiness, always accompanied by paralysis of the hinder extremities, and which is soon followed by severe convulsions, so that the animals die in a real state of excitation. C. Opium does not inflame the texture of the stomach, which alcohol does in a high degree."

Our author quotes the conclusions of Mr. Brodie, respecting the action of alcohol, which do not differ much from his own. Two experiments made upon dogs with sulphuric ether both proved fatal.

On the effects of carbonic acid gas and carbonic oxide our author offers nothing new. After slightly noticing some poi-

sonous plants, he concludes his account of the individuals of this class with a few observations upon the deleterious effects of strongly scented plants upon the animal economy. He seems, however, inclined to refer them in most instances to idiosyncrasy, or nervous susceptibility, which is extremely probable.

Our author now gives a summary view of the symptoms produced by this class of poisons; but as they greatly resemble what we have before quoted, or at least offer nothing characteristic of the class, we shall omit them. The same remark may be likewise made of the effects produced by them, and observable after death. The mode of action of the different substances seems, however, to be different, and to require different modes of treatment; thus the means recommended of counteracting the effects of the *belladonna*, *datura stramonium*, *tobacco*, *digitalis*, *anagallis arvensis*, *aristolochia clematitis*, the different species of *hemlock*, *rose laurel*, and *rue*, are in the first place, to procure vomiting by the exhibition of 20 or 30 grs. of ipecacuanha in a little water, by tickling the throat with a feather, &c. or, if some time has elapsed, to administer an active purgative, and afterwards, if congestion of the brain be denoted, to have recourse to blood-letting from the jugular vein. Acidulated drinks may be now given with advantage, and the usual means must be had recourse to, in order to remove the nervous or inflammatory symptoms that may remain. When the poisonous substance exhibited, has been one of those which produce asphyxia, such as the *strychnos* tribe, the *ticunas*, *woorara*, *upas-antiar*, *camphor*, or *menispermum cocculus*, besides the usual means, tracheotomy, and the inflation of the lungs with air, will be necessary; and in case the poison has been communicated by a wound, the application of a ligature, and deep cauterization of the wound are proper. When one of the *fungi* is the poisonous substance, M. Orfila recommends, after it has been removed by emetics and purgatives as usual, the exhibition of sulphuric ether, and the common means of obviating inflammatory or nervous symptoms, if they occur. When dangerous symptoms follow the use of alcohol, and other spirituous liquors taken in excess, the use of an emetic, and afterwards acidulated drinks are recommended. Bleeding also may be necessary in the young and plethoric,

with irritating clysters, and washing the whole body with vinegar. In cases of asphyxia by carbonic acid gas, &c. the usual means resorted to are proposed, which we do not think it necessary, therefore, to repeat here.

Class VI. *Septic, or putrefying poisons.* This class is intended to include those poisons which produce general debility, a dissolution of the fluids, and syncope, but which in general do not affect the intellectual faculties. Under this head are arranged by M. Orfila *sulphuretted hydrogen*, *venomous animals*, as different species of *vipers*, the *crotalus*, or *rattlesnake*, the *scorpion*, different species of *spiders*, the *bee*, *wasp*, *hornet*, &c. Poisonous fishes, as the *clupæa trhyssa*, the *coracinus fuscus major*, the *coryphœna hyppurus*, the *scomber maximus*, *muscles*. The poison of the *malignant and contagious pustule*, and the poison of *hydrophobia*.

Sulphuretted hydrogen. Our author, after giving the chemical characters of this gas, relates several experiments and observations made by himself and others upon animals. According to Chaussier, whom he quotes, the general symptoms it produces are convulsions, violent spasms of the abdominal muscles, great anxiety, unequal and intermittent pulse, respiration sometimes accelerated, sometimes retarded, dimness of the eyes, and a sensation of cold in the ears. His conclusions are—

"1. That sulphuretted hydrogen, either in its gaseous state, or in solution in water, proves powerfully poisonous to all animals. The gas is most active when respired, less so when introduced into the pleura or jugular vein, and still less when applied to the cellular substance, or taken into the stomach or intestines. That when applied to the skin its action is less rapid, and, as M. Nysten observes, its action is stronger the smaller the animal, so that a man can without inconvenience make use of sulphuretted baths, provided he does not remain too long in them, and that the gas does not enter the lungs.

"2. 3. That it is absorbed entirely, without undergoing decomposition; that, carried into the course of the circulation, it produces a general debility, an alteration in the texture of the organs, especially in the nervous system, and probably in

the composition of the blood. But that it may nevertheless be injected in small quantity into the veins without proving fatal.

"4. 5. It does not produce death by distending the heart, it being very soluble in the blood; and, lastly, that it acts upon man in the same manner as upon animals."

M. Orfila recommends in cases of asphyxia produced by this gas, the means usually had recourse to in similar affections from carbonic acid gas. When it abounds in any confined place, fumigation with chlorine may be employed.

Some experiments are here related which were made with the view of ascertaining the effects of putrid matters upon the animal economy. These, however, were not sufficiently numerous to decide the point in question, which our author intends to prosecute and present to the public in a separate work.

Venomous animals. These are divided into three classes, 1. Those who possess a reservoir of poison, and whose bite is dangerous and sometimes mortal. 2. Those who possess no such reservoir, but whose flesh, when eaten, produces dangerous consequences; and 3. Those whose fluids have been perverted by previous disease, and which are capable of exciting diseases in others by contact.

The first of these divisions includes all the serpent tribe, with the poisons of which our author does not appear to have himself made any experiments. He quotes, however, very largely from Fontana, Russell, Home, and others; but as the works and observations of these authors are in every body's hands, we do not think it necessary to notice them here.

Poisonous insects, including the *scorpion*, *spiders*, &c. are next treated of by our author, but he offers nothing new on the subject.

The second section includes, as we imagined, those animals whose flesh proves poisonous when eaten. These consist chiefly of various species of *fish*, and more especially *muscles*. On this subject M. Orfila offers nothing original, but, as usual, quotes largely from all the best authors who have written on it. He inclines to the opinion of those who believe that the poisonous properties of those animals depend very often upon their being in a state of putrefaction. He thinks also that in

some instances their effects must be ascribed to idiosyncrasy. To both these opinions we subscribe in part. We think it proved beyond a doubt that the poisonous effects of fish often depend upon some morbid or putrefactive state of their fluids. We think it also proved that some individuals are much more susceptible of the effects of these morbid changes than others. But we do not believe that the deleterious effects of those fish, which appear to be poisonous at all times and to all persons, can be referred to either of these causes.

The third section includes animals whose fluids are rendered poisonous by previous disease.

Pustule maligne, bouton malin, puce maligne. Malignant pustule. Many instances of this affection are quoted from Enaux and Chaussier, and others. Our author supposes that it depends upon a septic poison formed in diseased animals and putrid animal substances, and capable of infecting the healthy by inoculation, or application to an absorbing surface. Butchers, tanners, veterinary surgeons, &c. are therefore particularly liable to it, as are likewise anatomists. The symptoms of this affection are often violent and dangerous, and are detailed by our author on the authority of others, but he has himself added nothing new on the subject.

Rabies. On this important subject our author likewise adds nothing new, but he presents us with a valuable collection of observations from others respecting it. Spontaneous rabies takes place generally in the carnivorous animals, and sometimes even in the human subject; very rarely in the ruminating animals; to which the poison, however, can be readily communicated by inoculation. Spontaneous rabies has been ascribed to bad food, hunger, great fatigue under a burning sun, the presence of worms in the stomach, keen passions, fright, &c. but it is evident that neither of these causes is sufficient to produce it at all times, and therefore can be only supposed to predispose to the affection. Spontaneous rabies does not differ essentially from communicated rabies, which is the most common form of the disease. The symptoms of the disease, and the appearances found after death, are quoted from Enaux and Chaussier, Dupuytren and others, and are well worth the attention of the physiologist.

Our author now enters upon the mode of treatment to be adopted in cases of poisoning by venomous animals.

Serpents. The first remedy noticed is the *guaco*, a plant observed by Humboldt to grow spontaneously in the plain and valleys of *Rio de la Magdalena*, *Rio Cauca*, *Choco*, &c. in New Granada and other places. Of the effects of this plant, both as a preventive and cure to the bites of serpents, the most extravagant notions are entertained by the natives. Humboldt himself supposes that the smell of the plant is particularly offensive to the serpent tribe, and he relates some circumstances which seem to countenance this opinion. Our author next proceeds to examine the other remedies which have been proposed by various authors, and he concludes by giving a summary view of the mode of treatment to be adopted in these accidents. This consists chiefly in applying, if possible, a ligature above the wounded part, which is directed to be cauterized, either by the actual or potential cautery, and afterwards dressed with a liniment composed of oil and ammonia. Internally such means as promote perspiration and sleep, and are calculated to obviate distressing symptoms, are recommended.

For the bite of the *scorpion*, the internal use of ammonia and the external application of emollient fomentations, &c. are recommended. For the bite of *spiders*, brine, *theriac*, and vinegar, may be employed. For the bite of the tarantula, such means as are calculated to remove inflammation and swelling; and, for the sting of *bees* and *wasps*, the application of brine, or solution of the acetate of lead, &c.

The effects of poisonous *fish* and *muscles* are best obviated by first administering emetics and cathartics, and afterwards sulphuric ether upon sugar, with some antispasmodic. The drink should be acidulated with vinegar. If inflammation occurs, it of course should be obviated by the usual means.

In the *malignant sore* occasioned by putrid substances, the application of caustics, and those means calculated to produce healthy suppuration and obviate gangrene, are recommended. In the last stage, internal tonic and antiseptic remedies may be useful. Bleeding, and all those means calculated to produce debility, are hurtful.

Respecting the cure of *rabies*, our author concludes, after

taking a cursory view of the numerous remedies which have been recommended, that there is at present none known on which we can depend, and that the only means of counteracting the dreadful effects of this complaint is to cauterize the part as soon as possible.

There is an APPENDIX to this section in which some objections are answered, and some further remarks made, on different subjects treated of in the former part of this work. The first of these subjects is the *corrosive sublimate*, which has been denied by Dehorne to be absorbed. Our author, however, brings forward facts to prove that not only this salt, but also *artificial cinnabar* and *sulphuret of arsenic*, act as poisons when applied to the cellular substance, and consequently are absorbed. Sugar, in a former part of this work, was stated by M. Orfila, chiefly on the authority of Duval, to be an antidote to the poisonous effects of *verdigris*, but he has since been induced to change his opinion, though he thinks it may prove very useful after the poison has been expelled by vomiting. Albumen seems to be one of the best antidotes to verdigris. Many experiments are related which were made with the view of ascertaining the effects of charcoal, as an antidote to different metallic poisons, but the results are unfavourable to this opinion, and our author concludes that "charcoal possesses no particular advantage in cases of poisoning by corrosive sublimate, arsenic, verdigris, and probably other metallic salts," as stated by M. Bertrand. Some observations from Humboldt are here quoted respecting the *curare*, a poison used by the inhabitants of the neighbourhood of the Oronoko.

Some objections having been made respecting the operation of tying the œsophagus, so often had recourse to by our author, he here enters into a defence of that practice, and he concludes from his experiments, that the operation well performed, though it proves ultimately fatal, is not capable of killing, or even much incommoding an animal in two days, and that after death no injury is discovered on opening the body. Hence it cannot, according to him, much interfere with the action of a poisonous substance which speedily proves fatal, and he even attempts to prove that it is indispensable for

studying properly the effects of a poisonous substance. On this subject we have already given our opinion.

Sect. II. We come now to the second section of the entire work, which is a sort of recapitulation of the first, and in which the subject of poisons is treated in a general manner. In the first chapter M. Orfila considers the proper means of verifying a case of poisoning. The second chapter treats of *slow* poisoning.

The first chapter is subdivided into six heads. 1. Of the diseases which are liable to be confounded with acute poisoning. 2. The means by which the nature of the poisonous substance can be ascertained. 3. Experiments upon living animals, considered as a mean proper to verify cases of poisoning. 4. The means proper to distinguish if the poison has been introduced into the alimentary canal during life or after death. 5. The poisoning of several people at the same time; and, 6. Poisoning in cases of suicide or homicide. The diseases treated of under the first head, which may be mistaken for poisoning, are *indigestion*, *cholera*, *black-vomiting* and *diarrhœa*, *malignant fever*, &c.; the nature of each of which affection is briefly treated of, and the characteristic symptoms pointed out as far as they will permit. Many of these, however, especially in *cholera* and *malignant fever*, so strongly resemble the effects of certain poisons, that the nature of the affection can hardly be distinguished by them, but must be ascertained, if possible, by the circumstances of the case, and such other particulars as can be collected. The second head contains an epitome of the physical and chemical properties of the different organic and mineral poisons, arranged under different heads, and, when they will admit of it, in a tabular form. We briefly detailed these as we proceeded, and therefore shall not repeat them here; besides, this valuable part of our author's work will hardly admit of an analysis, and we are therefore under the necessity of referring our readers to the work itself. The other subdivisions of this head relate to the indications which the physician may draw from the symptoms during life, and the lesions found after death. Upon both these subjects our author offers very excellent remarks, and, in the third subdivision, he gives from Chaussier the best

modes of examining the different organs. Our author closes with some general conclusions, one or two of which we shall quote.

"That the physician cannot pronounce a person to be poisoned, unless he can unequivocally demonstrate the existence of the poisonous substance, either by chemical analysis or its physical properties. That in a case when the poison has been too minute to be discovered, but in which the morbid state of the alimentary canal and other circumstances tend to show that the person has been poisoned, the physician ought to intimate to the magistrate, that although the circumstances are in favour of the supposition that the person is poisoned, yet that the *actual proof* of the poisoning is wanting."

A recapitulation now follows of the effects of tea, wine, &c. upon various poisonous substances, and the modes in which they influence the operation of tests. On the third head some judicious remarks are offered upon experiments made upon living animals, the cautions necessary in conducting them, and the degree in which they are to be appreciated. On the fourth head are given the results of several experiments, which demonstrate, that poison introduced into the body some time after death produces effects which cannot be mistaken for those which it produces in the living body. Even if the poison be introduced immediately after this event, its effects are local, and confined to the parts with which it comes in contact.

The second chapter of this section on *slow poisoning* is short and unsatisfactory, and consists chiefly of cases selected from other writers. We think it had been better omitted, as it reflects no credit upon the author.

In closing our remarks upon this work in general, we must observe that the second volume is much less perfect than the first, a circumstance to be referred no doubt to the nature of the substances treated of, most of them being organic products. M. Orfila, who, we understand, is now visiting a foreign country, with the view of prosecuting his subject, is certainly entitled to the highest praise for his industry and perseverance, and we allow him the merit of having produced the best work on toxicology that has yet appeared, and which we recommend, therefore, to the careful perusal of every one

interested in the subject; but justice compels us to say that we do not think the information gained, especially in the present volume, to be in any degree adequate to the lives of so many hundreds of poor animals cruelly sacrificed on the occasion.

An Account of Two successful Operations for restoring a lost Nose from the Integuments of the Forehead, in the cases of two officers of his majesty's army; to which are prefixed historical and physiological remarks on the Nasal operation, including descriptions of the Indian and Italian methods. By J. C. CARPUE, Member of the Royal College of Surgeons of London, and formerly Surgeon to the York Hospital, Chelsea. *With engravings by Charles Turner, illustrating the different stages of the cure.*

[From the Annals of Medicine and Surgery, for June, 1816.]

OUR readers, we suppose, are well aware, that it was known ages ago, that different wounded parts, if brought together, would unite, and even if one were completely detached. The Indians have made new noses from the skin of the forehead time immemorial. They were made in Italy above three hundred years ago. Both Greeks and Romans were acquainted with the possibility of adhesion among parts either originally or accidentally separated. Yet from the slow progress which surgery till lately made, from the irregularity with which surgical education was conducted, and from the detached and unconnected situation of surgical practitioners, low in society, deficient in education, and therefore not constituting a republic, as they do at present, the practice of uniting parts, whether for the cure of wounds and the supply of deficiencies seems to have been known and followed, and again forgotten from time to time. Even in France at this time, few surgeons can be induced to heal a wound by the first intention, and every old English surgeon recollects when a piece of half detached scalp was cut off, instead of being laid down. M. Hunter and Duhamel made several experiments upon animal engrafting,

and from that time more and more progress has been made in uniting parts; although it is quite clear that nothing is now done in this respect that was not done long since, but what is now done is done systematically, and forms a part of regular surgical knowledge; whereas before it was done irregularly, and almost accidentally. A case was lately mentioned in the Edinburgh Medical and Surgical Journal, in which half of the left index, which had been separated by an axe, dropped in the dirt, and grown cold, united perfectly with the stump. But Garengeot, nearly a century ago, performed an exactly similar cure upon a man's nose.

"A soldier of the regiment of Conti, coming out of l'Epée Royale, from an inn in the corner of the street Deux-Ecus, was attacked by one of his comrades, and in the struggle had his nose bitten off, so as to remove almost all the cartilaginous part. His adversary perceiving that he had a bit of flesh in his mouth, spit it out into the gutter, and endeavoured to crush it by trampling upon it. The soldier, who on his part was not less eager, took up the end of his nose, and threw it into the shop of Mr. Golin, a brother practitioner of mine, while he ran after his adversary. During this time Mr. Golin examined the nose which had been thrown into his shop, and, as it was covered with dirt, he washed it at the well. The soldier returning to be dressed, Mr. Golin washed his wound and face, which were covered with blood, with a little warm water, and then put the extremity of the nose into this liquor, to heat it a little. Having in this manner cleansed the wound, M. Golin now put the nose into its natural situation, and retained it there by means of an agglutinating bandage and plaster. Next day the union appeared to have taken place, and on the fourth day I myself dressed him, with M. Golin, and saw that the extremity of the nose was perfectly united and cicatrized."—*Traité des Operations de Chirurgerie*, Vol. iii.

Very lately we have heard of a case in the twelfth volume of the *Dictionnaire des Sciences Medicales*, in which the arm of a soldier, completely struck off at the battle of Arlon, excepting a small piece of skin with subjacent artery and nerves, was united. The cure took up eight months; bone and muscles united, and the skin cicatrized. The limb continued some time

feeble and benumbed, and became inferior to the opposite arm in size, but the man was able to resume his rural occupations, in which he had been engaged before going into the army.

Before describing his cases, Mr. Carpue fills a number of pages with physiological remarks upon union by the first and union by the second intention, but there is nothing in them but what is universally known.

In the first of Mr. Carpue's cases, an officer had acquired a very mutilated state of nose by the abuse of mercury, exhibited for a liver complaint.

"Having well ascertained the size of the graft required, by means of a wax model, which I had then flatted and laid on the forehead, I drew the outline round it with red paint. I drew lines also on the sides, where I was to make the incision, and a line beneath for the septum. This done, the patient leaped upon a table, and laying himself upon his back, with his head supported by a pillow, refused to be held, saying, "I hope I shall behave like a man." Nor did he make the smallest complaint during the operation.

"I now made an incision on the right, and then on the left, and dissected out a sufficient quantity of face, with some muscular fibres of the *compressor nares* (*compressor narium*, but this is Latin) and the *levator* and *depressor labii superiores* (*superioris*, but this too is Latin) *alæque nasi*, to receive what was to be dissected from the forehead. I made a simple incision for receiving of the septum, considering that the inner part of the integuments would certainly unite with the upper part; and that if, when adhesion took place on the upper part of the lip, hairs should grow on the lower part of the integuments intended to form the septum, and the old and new parts in consequence should not unite, I could then, with greater safety, dissect the roots of the hair from the part, and bring it into contact with the lower part of the incision. My apprehensions appeared ultimately to have been groundless; for both surfaces readily united, and an excellent septum was formed.

"The parts of the face being prepared for the reception of the new nose, I began that part of the operation which belongs to the forehead, by making an incision along the lines I had drawn. I then dissected the integuments, merely leaving the

pericranium. The angular artery, on the left side, bled freely, but the loss of blood was very inconsiderable, and there was no occasion for tying the artery. The part which was dissected, and which hung down, became of a purple colour, and the patient at this period informed me that his forehead felt extremely cold. I applied warm sponges, which afforded great relief, and which were continued during the remainder of the operation.

"My next step was to make the *turn* of the dissected parts, and introduce the septum into the incision of the upper lip, where I confined it by ligature. After this, I brought the integuments exactly into contact with the integuments on the left side, and fixed them also by two ligatures, and then I did the same on the right. I introduced lint to distend the nostrils, and applied straps of adhesive plaster to keep the integuments in contact. Every thing being thus done for the nose, my concluding care was to bring the edges of the integuments on the forehead, and between the eyebrows, as near together as possible, and keep them so by means of adhesive plaster."

On the third day the dressings were removed, and adhesion discovered in every part. The new nose was flat, and rose and fell with every inspiration and expiration. On the ninth day, it became œdematous, but in about a month decreased in size. Five months after the operation, the portion connecting it with the forehead was divided—the postponement of which division constitutes the only difference between the Indian operation and Mr. Carpue's. After the œdema had subsided, the nose became flat, but granulations formed within, and it acquired a gradual enlargement and proper distention, notwithstanding it was supported by no bone nor cartilage.

The second case occurred in Captain Latham, who lost part of his nose in the battle of Albuera. The operation in this case was similar to the first in its nature and its success. Mr. Carpue has the merit of being the first in this country who performed a simple operation, performed indeed, before, innumerable times abroad, and in every respect similar to little operations which every surgeon among us performs every day, viz. the approximation of parts, that they may unite by

the first intention. He has shown no superiority of knowledge or of skill, but he has shown spirit, and that is unquestionably a merit. If Mr. Cline or Mr. Cooper had by chance performed the operation, instead of Mr. Carpue, they would perhaps have published an account of it in some periodical publication, filling at the utmost a couple of pages.

ORIGINAL REVIEWS.

FOR THE ECLECTIC REPERTORY.

Vegetable Materia Medica of the United States; or Medical Botany: containing a botanical, general, and medical History of Medicinal Plants indigenous in the United States. Illustrated by coloured Engravings, made after original Drawings from Nature, done by the Author, WILLIAM P. C. BARTON, M. D. Professor of Botany in the University of Pennsylvania, &c. &c. Philadelphia, printed by Mathew Carey & Son, Sept. 1, 1817. 4to, No. 1. pp. 76.

FROM the animal, vegetable, and mineral kingdoms the practitioner derives the various articles employed in medicine. Without any disparagement, however, to the animal and mineral substances, it will be readily conceded that the materia medica receives the largest supplies from the vegetable kingdom. In the systems of Lewis, Cullen, and Murray we have a full exposition of the materia medica, agreeably to the state of the science at the period in which the respective authors wrote. But the botanical description of the plants employed in the cure of diseases constituted no part of the plan of those works. It has been our misfortune, and we believe it has occurred to others, to experience considerable difficulties in the attempt to procure certain medicinal plants not common in our shops, yet growing within the circuit of a short walk. Among the various synonymes, the familiar names, by which plants are designated in a particular section of country, may be unintelligible where the inquiries are made, and verbal descriptions are often found to convey very inadequate information. To express the characters of the various indigenous plants employed in medicine, and to illustrate the descriptions with appropriate engravings, will be, therefore, considered as a very acceptable work.

In describing the plants Dr. Barton has adopted the following plan. He first gives the systematic name; next the fa-

miliar or popular appellation; after which follow the names by which the plant is occasionally known. He then refers to the authors who have noticed the plant. The generic character follows, together with a reference to the natural system of Jussieu, the natural order of Linnæus's natural method, and the class and order of the artificial system of this author. We are then presented with the specific character, the synonymes, and a short notice of the pharmaceutical preparations of the plant, its various properties, its medical uses, and doses.

The descriptio uberior is drawn from the Flora Philadelphica, a work which he promises to publish at no great distance of time. The text contains a familiar description of the plant, calculated for the generality of readers, the chemical analysis, where any has been published, then a history of the medicinal properties, some notice of the economical uses; and the history is completed by an explanation of the plates, and the dissections of the flowers and fructifications.

In the engravings, those who may not be familiar with the science of botany will readily identify the respective plants. The professor's great skill and taste in drawing have enabled him to execute this part of the work with uncommon success.

The first article contained in this number is the Chimaphila Umbellata, vulgarly known by the names of Pippsissewa, or Winter-green. It grows abundantly in all our forests from Canada to Georgia, and is occasionally met with in Florida. It particularly delights in a loose sandy soil, and thrives most luxuriantly under the shade of trees.

By chemical analysis it affords an astringent matter, which, according to the experiments of Dr. Mitchell, published in his inaugural dissertation in 1803, strikes a dark black with the sulphate of iron. It yields about one third of its weight by maceration in alcohol. This extractive matter contains a portion of gum, which is soluble in water. The plant contains much less gum than resin.

This plant has lately attracted considerable attention, on account of its diuretic properties. It is generally given in the form of decoction, prepared by macerating an ounce of the dried plant, including root, stalk, and leaves, cut small, in a quart of water, for twelve hours, and then boiling till it yield

one pint of liquor. This quantity may be given in 24 hours. From 34 pounds of the recent plant Mr. Carter obtained 4 pounds of extract. This extract is conveniently administered in the form of pill, or it may be given dissolved in a small quantity of boiling water. Of this extract Dr. Somerville gave five scruples in 24 hours. We offer this brief notice of the Chimaphila. For a fuller account we refer to the work before us. The Medico-Chirurgical Transactions vol. V., contain at large the observations of Dr. Somerville and of the late professor Barton. From the reputed virtues of this plant, it ought not to be confined to exciting diuresis. Tinea capitis, and the various forms of scrofula, are stated to yield to this remedy. Its mild tonic properties render it particularly adapted to the last stage of consumption, and it has accordingly been recommended in this disease. The trials we have witnessed were too short and imperfect to justify our offering a positive opinion respecting the efficacy of the Chimaphila umbellata in that so generally fatal disease.

Sanguinaria Canadensis. Blood-root. Puccoon. Besides the beautiful red dye imparted by this plant, it is endowed with properties which entitle it to a place in the materia medica. When given in small doses, it is stimulant, diaphoretic, and expectorant. In doses of fifteen or twenty grains, it proves emetic. The powder creates irritation in the fauces, on which account it is directed to be given in the form of pill. This acrimony of the Sanguinaria Canadensis seems to render this article objectionable, when it is the intention of the practitioner merely to excite vomiting, as the slow solution of the pill must cause the operation of the medicine to be protracted beyond the period corresponding with the indications where emetics are administered. The hint offered respecting its anthelmintic properties may not be unworthy of notice. The slow solution of pills will occasion the article to be more diffused through the intestinal tube, whereby it will more completely act upon the parasitical animals intended to be dislodged. According to the observations of Dr. Downey, the leaves and seeds are deleterious. The seeds producing effects analogous to those observed from the seeds of the stramonium.

The season for collecting this plant for medical purposes is when the seeds are ripe, which is about the beginning of May.

Cornus Florida. Dogwood. This is the largest shrub growing in our forests. From the size it frequently attains, it seems well entitled to be classed among the trees, and has been raised to that rank by Michaux, in his elegant work on the forest trees of North America. The astringency and bitter taste, so obvious in this plant, are calculated to bring it into notice as a tonic. It has been famed for its virtues in the cure of intermittents: but it has acquired this character rather from popular report; few practitioners having been in the habit of employing it. The only testimony which has been collected is that of Dr. Gregg, of Bristol, on whose authority it is stated not to be inferior to Peruvian bark, in the cure of intermittents, nor inferior as a corroborant, in all cases of debility.

Dr. Barton considers that, "as a tonic, the powdered bark of the Cornus Florida is well entitled to the notice of physicians, and that it may certainly be recommended as a good substitute for the cinchona, particularly as that which now fills the shops is seldom genuine, but adulterated by oak bark, and frequently altogether a factitious article." He further remarks, "that its superior miscibility, or solubility in water, to the Peruvian bark, may occasionally render its use more convenient than this last substance."

Triosteum Perfoliatum. Fever root. Red flowered Fever root. The root reduced to a power, and given in the dose of 20 or 30 grains, operates as a gentle cathartic. Larger doses will excite vomiting. This emetic property is the only one noticed by Schœpf, and has obtained for this plant the popular name of bastard ipecacuanha.* The author of the Medical Botany states that "the part of the plant used for medical purposes is the cortex or bark of the root. When the root is dry, it is brittle and is easily pulverized. Perhaps it is not necessary to separate the bark from the ligneous part; for in all likelihood the whole root is endued with the same medicinal property. The autumn is the proper time for collecting the plant."

The berries are stated, on the authority of Dr. Muhlenberg, to have been used as a substitute for coffee; and wild coffee is an appellation sometimes given to this plant.

Two other articles, the Gillenea Trifoliata and the Gillenea Stipulacea, are introduced into this number. They are stated to be endowed with emetic properties, and may be occasionally substituted for the ipecacuanha of the shops, though they are scarcely entitled to a preference.

FOR THE ECLECTIC REPERTORY.

Memoir on Angina Pectoris, which obtained the prize at the meeting held by the Medical Society of Paris, on the 31st of October 1809, *and which was awarded on the 2d of February* 1813. By L. JURINE, corresponding member of the National Institute.

[Translated from a Review by Sené.]

THIS memoir treats of a disease scarcely known more than fifty years, and which has given rise to great diversity of opinion respecting its existence as a purely spasmodic affection. Some, at the head of whom we may place Heberden, Hamilton, Macbride, Darwin, Desportes, have not scrupled to assign it this character, admitting, however, that it is capable of being more or less complicated. Others, as Parry, Bostock, Jenner, have considered it as dyspnœa symptomatic of an organic affection of the heart or the great vessels, and particularly of an ossification of the coronary arteries. To these causes Fothergill added excessive obesity, a great accumulation of fat in the chest, or a collection of water in that cavity or in the pericardium. Others, setting aside all idea of an essentially distinct disease, have supposed that the angina pectoris was only a modification, sometimes of spasmodic asthma, sometimes of irregular gout or rheumatism, and that the records of both the ancients and moderns contained innumerable cases of this kind, which would afford grounds for admitting a new species of disease with as much propriety as those which formed the basis of the theory of Heberden and his followers. To this class belong the works of Berger, Elsner, Butter, Macqueen; and such is apparently the prevailing doctrine in France.

The hypothesis of Heberden has lately received additional support in the very respectable authority of Jurine, a distin-

guished practitioner in Geneva, to whose memoir on the angina pectoris the prize was adjudged, about two years ago, by the Medical Society of Paris.

"Agreeably to the conditions proposed by the society, it will be necessary to offer a description of the disease known, especially among the English physicians, by the name of *angor pectoris* and angina pectoris: to explain the causes which produce it; to point out the authors who have written on the subject; and to indicate the diseases which resemble it, the affections with which it may be combined, and to which it gives origin."

In compliance with these conditions, Dr. Jurine has divided his memoir into three chapters. In the first he gives the synonymes, the definition, and description of angina pectoris; in the second he treats of the symptoms, causes, prognosis, and method of cure. The third offers a collection of observations on angina pectoris both simple and combined, and on the diseases which bear it any affinity.

The author next assigns the order in the nosological table which, according to him, is adapted to angina pectoris. His work closes with some remarks on the authors, ancient and modern, who have written on this disease. At the end of his memoir he has comprised, under the title of appendix, or post scriptum, &c. some very interesting remarks on the observations or works, lately published, having reference to this subject.

Chap. I. *Denomination, definition, and description of angina pectoris.*—The names given to this disease bear the impression of the hypotheses entertained by their respective authors. Thus Sauvages calls it *cardiagmus cordis sinistri;* Elsner *asthma convulsivum;* Butter *diaphragmatic gout;* Schmidt *asthma arthriticum*, &c. Some of these names are derived from some predominant symptom, such as *angina pectoris*, the appellation given by Heberden, *syncope anginosa* by Parry, and *sternalgia* proposed by Baumes.

The definitions given of angina pectoris have differed no less than the names by which it has been designated. Dr. Jurine defines this disease "a painful and distressing constriction felt across the chest, excited by walking, and soon subsi-

ding on rest, and not then accompanied by palpitations, irregular pulse, nor oppression; but solely by a slight impediment in breathing."

Rougnon of Besançon appears to be the first who considered the disease as constituting a particular species: but to Heberden we are indebted for the full exposition. He first pointed out the pathognomonic symptoms, the suddenness of the attack, the acute pain in the sternum, the sense of constriction and distress in the chest which always accompanies it, the extreme danger of the disease, the immediate disappearance of all the symptoms when it does not prove mortal, &c., from which circumstances he was induced to class it among the spasmodic diseases.

The tract published by Elsner, in 1778, appears to have been rather a compilation than the result of the author's experience.

Butter, in 1791, considered the disease as gout affecting the diaphragm. In the description he has given he has added little to the observations of Heberden. He has, however, marked with precision the precursory symptoms, as the heat in the chest, which gradually increases, the flatulence of the stomach and intestines, the darting of the pain from the sternum towards the ribs and up the neck, where it produces a sense of suffocation, the manner in which respiration is affected during the paroxysm, and which, to use his expression, "is rather a tightness and sense of fulness in the chest than a real difficulty of breathing."

If this description possess not sufficient clearness and precision, that of Dr. Parry is more perfect. He has remarked that angina pectoris attacks more frequently men, especially those who are corpulent; that it is more frequently observed in those of forty years and upwards, which accords with the observation of Heberden; that the first symptom is a pain in the sternum, extending commonly from the centre of that bone to the left side of the chest, and continuing to the left arm, a little above the elbow; sometimes, though rarely, to the right side, and even as far as one or even both hands; that the moment the patient feels this pain he is seized with the fear of instant death, and desists from exercise &c. He has observed that

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during the paroxysm the pulse is most frequently but little affected in point of regularity; nevertheless he believes that it may be more or less feeble according to the violence of the attack; moreover, that a return of the paroxysms has been caused by walking after a full meal, by strong emotions of mind, &c.

The description given by Wichmann agrees in many respects with those of Heberden and Parry, only he asserts that the sensation experienced by the patient, and which threatens suffocation, is not a sense of constriction of the chest, but an undefinable sensation which takes away his breath. He adds, that in the cases especially where, from the long continuance of the disease, the pain extends to both sides of the neck towards the lower jaw and ears, the patient feels the parts, as it were, contracted or stretched, and that sometimes the œsophagus appears to him compressed.

Dr. Jurine, taking advantage of the labours of those who have preceded in this career, and corroborated by his own observations, has given a description of simple and idiopathic angina, which we believe we ought to transcribe literally, for fear of altering the sense by attempting an analysis.

"The first attacks of this disease are sudden. The patient is seized, while walking, without any previous indisposition. His respiration appears to be stopped, though not really so. He experiences in the chest a sensation of anxiety and distressing constriction, threatening suffocation if he continues to walk, and compels him to stop. This sensation, more distressing than painful, lasts only a few minutes. After a moment's rest the patient recovers, and again renews his walk without experiencing any uneasiness.

"If the patients endeavour to point out the seat of pain, they describe it as across the sternum, seated higher or lower. If they attempt to explain the kind of feeling, they compare it to a painful pressure on the chest, forcing the sternum in towards the spine. If they wish to mark the period of their attacks, they assert that they are more exposed after taking their meals, when walking rapidly or up a rising ground, or ascending the stairs, or going against the wind.

"The earlier attacks are light and with considerable intervals.

In proportion as they are repeated they acquire more violence and a longer duration; so that in the second period of the disease, the paroxysm is observed to continue for half an hour, an hour, or even longer. Then the seat of pain seems to extend further; and, inclining more frequently to the lest side, affects the arm just below the insertion of the deltoid muscle, and also often the forearm and wrist, and even the fingers' ends. In some instances both the upper extremities are simultaneously affected.

"Though this affection of the arms is a common symptom in angina pectoris, instances occur where the pain extends up the neck as far as the lower jaw and the ears. In others the pain descends into the epigastrium.

"When the paroxysm abates, the patients are sensible that the radiating or symptomatic pain, which ever it may be, declines in a course the reverse of that in which it came on. Soon after the pain in the sternum vanishes, and no other uneasiness remains but a slight gnawing in the chest. The eructations, when they occur, which is not usual, announce the termination of the paroxysm.

"In this second period the causes capable of exciting the disease are increased, so that the attack which occurred only in the day time, and from some very obvious cause, comes on during the night, especially after the first sleep; and it is brought on by the least exercise, by a slight fit of passion or inquietude of mind, while passive exercise exerts no such influence

"During the paroxysms the patients preserve sufficient freedom of breathing to draw a full inspiration. Often they feel the inclination, and are heard to sigh deeply. Neither palpitation nor intermission is observed in the pulse. It is corded and rather quicker. The urine is not altered in quality or quantity. The bowels are not moved. Some patients are pale during the paroxysm. Others have the body bedewed with perspiration.

"In the third and last period of the disease, the persons die suddenly; or if this is not the case, the disease is complicated with affections of the lungs, heart, or brain, which I shall not attempt to enumerate

"It is remarkable in angina pectoris, that those affected with the disease enjoy very good health during the intervals. On seeing them no one would suspect them to be affected with a disease eminently mortal. Nothing announces it in their external appearance. They eat and drink and perform all their functions as before. Their sleep is at times disturbed, and they are obliged to be very cautious in taking any active exercise.

"Among the number of persons affected with the disease who have come under my care, as many were of a spare as of a corpulent habit. I have seen but one under the age of fifty; and I have known but one woman who died of it.

As regards the influence of the seasons, or the temperature of the weather, I have not observed any thing which would authorize me to draw any general conclusions."

CHAP. II.—*Of the symptoms of angina pectoris, of the cause, of the prognosis, and of the treatment.*—All who have written on angina pectoris have considered the pain in the sternum as a pathognomonic symptom of the disease; but great discrepitancy of opinion prevails respecting the nature, the precise spot, and extent of this symptom. Jurine's opinion is very similar to that of Heberden.

The spot where the pain occurs in the beginning of the paroxysm, the little effect it has on the circulation and breathing, the perfect state of health enjoyed, for a long time, by persons affected with this disease, constitute so many reasons which, in the estimation of Jurine, preclude the possibility of its being connected with the heart, pericardium, lungs, or pleura. Reasoning in this way by exclusion, he is induced to refer this pain to the thoracic plexus of nerves; and he is particularly inclined to this opinion from the manner in which this distressing sensation originates, is propagated, and terminates; the long intermissions, the influence of the passions, and of sleep. The sympathetic effects extended to the upper extremities, the lower jaw, &c.

Writers are still less agreed about the state of the pulse in angina pectoris. Some have often perceived no alteration; others have discovered it to be intermittent and irregular; but nearly all allow that it is feeble and depressed, so as to be scarcely perceptible. Dr. Jurine, who has observed this last

condition, never found it intermittent or irregular. He however states that he never had an opportunity of examining the pulse in attacks which proved mortal. He is of opinion that the pulse is irregular or intermittent in the beginning of angina pectoris only when the complaint is symptomatic of an organic affection of the heart or larger blood-vessels, and that if in the course of the disease the pulse acquires this character, it is owing to the combination with some organic change.

The physicians who have written on angina pectoris do not give the same account of the disturbed state of respiration during the paroxysms; and this is probably owing to the inability of the patients to describe with accuracy sensations so closely bordering on annihilation. Notwithstanding this obscurity in their expressions, it is obvious that the alteration in question is not a true dyspnœa (the cases of complicated disease being excepted) for the patients feel the desire to make a deep inspiration, and have the power of holding the breath, without exciting pain or cough. In the patients who came under the care of Dr. Jurine the respiration was not confined; it was rather more frequent than common.

The eructation at the close of the paroxysm is not a constant symptom.

Having discussed the character of the symptoms commonly *considered* as essential to angina pectoris, Dr. Jurine next enters on the examination of the most important point in the inquiry, viz. the immediate cause of angina pectoris. With this question are connected the numerous hypotheses offered respecting the nature of the disease, whether it be an idiopathic or symptomatic complaint.

We have already noticed the opinion of Heberden, Fothergill, and many other respectable physicians.

Elsner, and after him Schaeffer and Schmidt, considered gout, and occasionally the rheumatism, as the principal causes of this disease. Butter adopted the opinion of Elsner, and made it the more explicit, by admitting that the gout was fixed on the diaphragm.

Wichmann undertook to refute the hypothesis of Elsner. He asserts, as worthy of being remarked, that of thirteen persons affected, whom he had visited, with angina pectoris, none

had the gout. He does not, however, pretend that the two diseases may not exist at the same time.

Baumes admits the ossification of the cartilages of the ribs as among the causes of angina pectoris; and to this alteration Rougnon had ascribed the disease of Mr. Charles: but besides that the ossification of the cartilages of the ribs has been observed only in a few persons who have died of angina pectoris, nothing is more common than the ossification in the bodies of persons advanced in years, without such persons having experienced any inconvenience during life.

Jenner and Parry having met with ossification of the coronary arteries of the heart in the bodies of several persons who had died of this disease, have been led to consider this ossification as the cause; but the coronary arteries have often been observed to be ossified without occasioning angina pectoris; and, on the other hand, the disease has occurred without any ossification of these arteries. The truth of this position is confirmed by two observations of Morgagni (De causis & sedibus Morborum, lib. 2. epist. 24. xvi. & epist. 26. xxxi.) Senac and Corvisart report cases in which the ossification of the coronary arteries of the heart did not occasion the symptoms of angina pectoris.

Dr. Odier of Geneva considers the many cures of angina pectoris effected by himself and others, by means of antispasmodics, as an irrefragable proof that the disease does not depend upon any organic alteration, and that it is a nervous affection of the lungs.

Dr. Jurine, who adopts the opinion of his countryman, moreover adds, that if the heart died first, as we are led to suppose from the theory of Jenner and Parry, the pulmonary vessels should be found collapsed and void of blood, and the left auricle and ventricle filled with blood of a florid colour: but it has been observed that the blood contained in the vessels, whether arterial or venous, was of a dark colour, and did not coagulate after a long exposure to the atmosphere.

We have already presented most of the arguments offered by Dr. Jurine for classing angina pectoris among the nervous diseases. We shall merely recal the attention of our readers to the unexpected attack of the disease, its sudden termination

in the restoration of health or in death, the nature of the occasional causes which induce most commonly a return of the disease, the equality and regularity of the pulse, the freedom in respiration, the distressing sensation extending to the upper extremities of the jaw.

In ranking angina pectoris as a nervous affection of the lungs, Dr. Jurine thinks he can explain the symptoms observed during the paroxysms of this disease.

It is the generally received doctrine among physiologists, that respiration really consists in an alteration in the colour of the blood, effected by the oxygen of the atmosphere, and that this process is exclusively performed in the pulmonary cells. It is supposed likewise that these cells are capable of spontaneous distention, and this is not performed, or but imperfectly, in angina pectoris. The cause of this alteration in the functions of the lungs appears to exist in a decay of the vital powers of these organs, and accordingly this disease occurs only in persons advanced in life. When the lungs have partially lost their powers, the slightest disagreeable impression is sufficient to impede their functions. Dr. Jurine has compared the attacks of angina pectoris, when not intense, to the oppression and necessity of taking breath experienced by an aged person when ascending a hill. Before he can resume his steps, his lungs must recover, by a little rest, sufficient energy to complete the oxygenation of the blood. Our author likewise compares the symptoms of angina pectoris to the effects experienced by travellers, who, like Saussure, have climbed lofty mountains. Their strength soon failed, so that they were in danger of fainting, if they continued to ascend. But what is remarkable, and fully establishes the resemblance between angina pectoris and this kind of fatigue, is, that a moment's rest was sufficient to repair their strength completely.

But how shall we explain that causes so diametrically opposite as exercise and sleep should produce the attacks of angina pectoris? As respects exercise, it is sufficiently evident that the increased activity which it occasions in the circulation accelerates the breathing, and imposes on the lungs greater labour; and that this increased action must, sooner or later,

induce fatigue, which throws these organs into a kind of paralysis. From that period suspension, or great diminution in the chemical phenomena of respiration, whence the disoxygenation of the blood, deleterious influence of the dark coloured blood on all the organs, and principally on the heart and brain; but as soon as the current of blood is retarded the strength and the ability to walk return.

To explain how sleep favours the attack of angina pectoris, Dr. Jurine states, that in persons affected with this disease, sleep appears to suspend, more or less, organic life, so that the chemical phenomena of respiration are more and more diminished, until the patient awakes in a state of anxiety and demi-asphyxia.

The resemblance of the symptoms of angina pectoris to the effects produced in animals in whom Dupuytren, Dumas and Provençal divided the eighth pair of nerves, with the view of ascertaining the influence of these nerves on the changes which take place between the blood and the air in respiration, renders it probable that in both instances death is the consequence of the nervous affections of the lungs.

Dr. Jurine expresses in the following terms his opinion of the causes of angina pectoris.

1st. The immediate cause of this disease is connected with an affection of the pulmonary nerves, which disturbs the functions of the lungs; impairs the oxygenation of the blood; and produces, previous to the attack, the pain in the sternum.

2d. Angina pectoris rarely occurs but in persons whose lungs are weakened by age, or who are of a constitution particularly predisposed to the disease.

3d. The morbid affection of the pulmonary nerves must in time be communicated to the cardiac plexus, and affect the heart and vessels secondarily.

4th. The imperfect oxygenation of the blood lessens its stimulating powers on the heart and lungs, gives rise to reiterated attacks, until this stimulus being exhausted, occasions the death of these organs and then of the brain.

The remedies proposed for the cure of angina pectoris are as various as the speculations respecting its nature. Hence those who, with Heberden, considered it as a spasmodic dis-

ease, have particularly extolled opiates. Elsner recommends the same treatment as in gouty affections. Parry enjoined rest, temperance, and the antiphlogistic regimen. He likewise resorted to opium, laxatives, and tonics, according to the indications taken from the violence of the paroxysm, the state of constipation, &c. Fothergill directed a vegetable diet. Johnstone cites a cure effected by pills of assafœtida, camphor, and the extract of cicuta. Dr. Odier prescribed the strictest antiphlogistic regimen. Professor Baumes speaks in high terms of the phosphoric acid. Others state their having employed with success blisters over the sternum, emetics, electricity, James's powders, &c.

We shall now offer some notice of the practice adopted by Jurine. Convinced that the violence and the danger of the disease depend on the frequency of the paroxysms, he endeavours to ascertain and remove the causes which occasioned the first attacks. He advises his patients to reside in the country; to occupy the ground floor, provided it be dry; to take short airings, especially in a carriage; and to indulge in light readings. Diet consisting of an equal proportion of vegetable and animal food is the best adapted to support the strength of the patients. They may take a little wine at their meals. These, especially the supper, ought to be light. The disordered state which occurs during sleep generally yields to a few grains of Dover's powder. It will be proper to keep the bowels open by means of glysters. The patient ought to be warmly clad; to avoid the damp; and to observe the strictest continence. Dr. Jurine directs them to take three or four times a day valerian root in powder, substituting occasionally the cinchona or some other tonic. Besides these remedies he prescribes the cold bath. If the person has been subject to any cutaneous disease, to rheumatism, gout, &c., he ought to have one or two issues on the thigh, and take antimonials and antispasmodics.

If these means afford relief, in order to complete the cure, they must be continued for a length of time, carefully avoiding every thing that is gloomy.

If the disease increase; if the paroxysms become more frequent, more violent, and of longer duration, there will be reason to apprehend some organic lesion of the heart and the neigh-

bouring vessels. We must then substitute other antispasmodics, and in combination with bitters. Dr. Jurine is even of opinion that the ammoniacal copper, the nitrate of silver, the arsenites of potash and soda may be employed with advantage. When plethora prevails, leeches should be applied to the verge of the anus. If there is any indication of an effusion of serum in the chest, hydragogues and the foxglove should be administered. Lastly, the injurious effects proceeding from a deficient oxygenation of the blood, provided the angina is not complicated with phthisis pulmonalis, may be obviated, according to Jurine, by the inspiration of a mixture of oxygen and atmospheric air.

CHAP. III.—*Of simple and idiopathic angina pectoris; of the disorders produced by it, of those with which it may be complicated, and of the diseases which resemble it.*—This chapter commences with a collection of cases, partly extracted from the most respectable authorities, and partly taken from his own observations; and which Dr. Jurine has brought together with the view of establishing the specific character of idiopathic angina.

The ten first are cases of simple idiopathic angina pectoris; the following twenty-one are cases of angina combined with various lesions of the natural and vital organs. These cases would lose much of their value if we were to attempt any abridgment. We shall therefore refer our readers to the memoir itself. We will only make the following remark: that in many of the cases considered by Dr. Jurine as belonging to simple idiopathic angina pectoris there was no examination of the dead body; and where such examination was made, ossifications and other morbid changes were observed; hence these cases do not appear calculated to establish the original and specific character of the disease. In perusing the cases of angina pectoris supposed to be complicated, many physicians, besides ourselves, will probably find that it is often very difficult to ascertain that these complications are not the disease itself.

Dr. Jurine states that there is scarce any besides spasmodic asthma and the organic lesions of the heart which offer any symptoms resembling in any degree the angina pectoris; and a

careful examination will enable us to distinguish these disorders. Thus, the paroxysms of asthma usually come on in the night; they continue much longer than those of angina; the peculiar nature of the breathing, which is accompanied by a wheezing; the desire for fresh air; the remissions, which are always gradual, &c.; these are so many features by which spasmodic asthma may be distinguished from angina pectoris.

Most of the diseases of the heart produce in the several functions, and especially in the circulation and in respiration, derangements which have been well described by Corvisart; and which must generally remove all uncertainty in the diagnosis.

From what has been already stated we need hardly repeat that Jurine classes angina pectoris among nervous diseases. His arrangement is founded on the following arguments.

"The attacks and termination are always sudden.

"There are long intervals of perfect health.

"The attacks are mostly brought on by some distress or strong emotion of mind.

"The disease may continue for years without materially affecting the health.

"The attacks are rarely occasioned by passive exercise.

"During the paroxysm the pulse is not accelerated.

"The attacks frequently come on after the first sleep.

"The non-oxygenation of the blood evidently announces the influence of the nerves."

Here terminates the task we had undertaken. Every consideration induced us to offer a full analysis of this production of Dr. Jurine; the justly acquired celebrity of the author; the interest naturally inspired by the subject he has treated of; the high character of the judges who awarded him the premium.

FOR THE ECLECTIC REPERTORY.

Minutes of Cases of Cancer and Cancerous Tendency, successfully treated by MR. SAMUEL YOUNG, Surgeon; author of a Treatise on Cancer and other surgical works; *with a Prefatory Letter addressed to the Governors of the Middlesex Hospital by* SAMUEL WHITBREAD, Esq. M. P. London, 1816, pp. 170, 8vo.

ANY information on this very interesting subject, must be highly gratifying to the medical practitioner, as well as to the numerous sufferers from a disease, whose cure is generally regarded as hopeless.

The following account of the process employed, comprehends the author's practice, minutely detailed in several successful cases.—In addition to the dressings and pressure, we find that he makes frequent use of digitalis and arsenic.

As the subject appears to have excited much interest in Great Britain, we may expect further accounts of it from thence. The present publication will serve to direct the attention of our medical brethren in the United States to make trial of the remedies proposed for this terrible disease; and if the application of the remedy should be perfected among us, it will be a cause of general congratulation.

"Pursuing the same train of facts, an account of which was published in 1805, under the title of 'An Inquiry into the nature and action of Cancer, in order to establish a principle of cure by natural Separation,' where it was proved, that the disease can only exist under a previously altered and morbid accumulation of structure; but considering the necessarily confined application of such a principle of cure, in a disease so complicated, so variously acting, so indefinite in extent, and so often involving parts necessary to life itself; the idea of a more extended effort for the removal of the disease by *Mechanical Pressure* suggested itself; and so far back as the year 1809, in two cases, it was successfully employed.

"The principle of this practice was found in the obvious facts, which nature is constantly presenting in the operations

of the Animal Œconomy, viz. the removal of parts by absorption, and particularly under the excitement of pressure. It is true such facts were presented through the medium of disease, but the principle was the same, and only required another direction to obtain beneficial and healthy results.

"If by diseased tumours the brain can be absorbed, the bones of the scull removed, or the testis in hernia congenita obliterated, to reverse the powers of absorption seemed feasible. If by diseased pressure healthy structure could thus be removed, why not imitate such pressure, and take advantage of such powers, by directing them to beneficial purposes, and destroy in turn morbidly formed parts or tumours, by the very means with which Nature has furnished them for the destruction of natural structure?

"By such morbid pressure arterial action also is suppressed. Why then should a tumour of the neck, for example, be suffered to proceed in all the licentiousness of disease, destroying on the one hand by its pressure the natural circulation of parts, and on the other exciting the absorption of natural by unnatural structure; when the same pressure *employed* on its own surface would obstruct its growth, and *cause* its own *absorption?* Under this impression, and on the principle that mechanical pressure resists vascular action, and excites the absorbents, it was adopted as a mode of cure for the removal of cancer, and other diseases dependent on previously altered and morbidly accumulating structure. One might enter largely on the more minute operations of this process, in the prevention and restoration of diseased structure; but the present object is simply to give a brief statement of leading facts. There are, however, many curious and important truths, connected with and illustrative of the nature and history of diseases of this class; the detail of which shall be given at some future opportunity.

"The means generally employed to effect the pressure, as stated in the following cases, have been plaster straps, sheet-lead, forming shields of various thicknesses, tin plates, linen compresses, aud the use of appropriate rollers.

"The strength of the application of the pressure has been progressive; commencing in most cases with the use of the

straps only; in some by single, and in other cases by double layers. The force of their application controlled in each instance by the existing circumstances, and the sensations of the patient.

"The plaster should be uniformly smooth; and in the application of the straps it is of the first importance that all wrinkles should be avoided; that an equal surface of resistance should be given. In the direction of specific pressure on a diseased part, all sort of partial stricture must be avoided, according to the common principles of surgery, which may be illustrated by the now common treatment of an ulcerated leg, after the admirable plan of Baynton. Here the ulcer of the leg is specifically compressed, although general pressure is also given to the limb, by the use of the roller. So a scirrhus of the breast may be specifically compressed, by the use of the pressure plates, and the adjustment of the linen compress, including at the same time, a general pressure of the whole.

"Almost every case will present varieties, and the practitioner always carrying the principle and object of cure in view, must have recourse to his own judgment and resources, to meet the exigencies of complicated cases. Generally speaking, the application of pressure has been found to relieve pain, and that in the most exquisite and actively painful states of cancerous affections.

"After several trials, the best composition for the plaster-straps, has been found in equal parts of the common strengthening and soap plasters mixed, and spread, somewhat thickly, on linen.

"A plaster so composed, has elasticity, consistency, and durability, which the common adhesive plaster does not possess; and what is more material still, none of its irritating qualities. It may be used in a diseased and tender state of skin, where the adhesive plaster in practice would inevitably produce irritation and extensive ulceration.

"It is to be noted, that in cases of ulceration, where a dry scale or thick incrustation is formed, an increase of discharge is no reason for the discontinuance of the applications. In such cases, an increased discharge is the constant attendant upon the restoration of parts under pressure. In all such cases,

and where the skin is tender, shining, partially broken and diseased, the parts should be well charged and dusted with chalk, or hair-powder, or both. In all cases the straps should be long and commanding. Irritable points and parts should be defended by some gold-beater's skin.

"The common anxiety which every surgeon must necessarily possess for the welfare of his patients, and those feelings of humanity, which the sad experience of the sufferings of our fellow-creatures naturally excites, will always lead to the application and removal of the pressure with due caution and tenderness."

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

Of the State of Medicine, &c. &c. in France.

BY SIR T. CHARLES MORGAN, M. D.

[From Lady Morgan's France.]

In theory, the French are, for the most part, attached to the Brunonian doctrines, which they mix up and assimilate with no inconsiderable relics of the humoral pathology. They are either wholly ignorant, or eminently fearful, of the modern practice introduced by Dr. Hamilton. It occurred to the author of these observations, to see two patients of one of the most celebrated of the Parisian physicians, who were labouring under serious and alarming symptoms of low fevers, De alvi statu nulla fuit inquisitio, ne enema quidem, consuetissimum aliàs remedium, hisce ægrotis adhibitum.

Purgantibus uti, quæ alvum acriùs movent, Parisiis, religio est; nec in officinis pharmacopolarum servatur medicamentum quod Extractum Colocynthidis audit; usque adeo in despectu est apud medicos. Quæ verò alvum lenius ducunt, nec temeré nec sine apparatu quodam adjuvantium, vel in re minime ancipiti dantur. Jusculum, manè sumptum, causa fuit, quo minus meridiè adhiberentur ægroto, quem ipse curavi.

With respect to calomel, the practice of England is ridiculed by the French, as to the last degree empirical: no authority can induce them to administer it as a cathartic in fever, nor as an alterative in many of the diseases, in which it is advantageously employed with us. In this respect, however, it would not be just to place their dislike wholly to the account of prejudice and obstinacy. The very trifling abuse of spirituous liquors which occurs in France, and the little intercourse which subsists between that country and the East and West Indies, very much exempt the inhabitants from that class of liver complaints which are so abundant in England; and which,

masked under various insidious forms, extend the efficacy of mercurials to a vast many different complications of disease. The same cause also operates to simplify fever, and to render its connexion with visceral obstruction less common and less violent. Possibly it may also contribute to preserve a greater sensibility of the intestinal canal, which may render the employment of drastic medicines less safe and less necessary.

But with every possible deduction on these accounts, it must be confessed, that the apprehensions thus entertained are excessive and unwarranted. The cutting short of fever, by the administration of a dose of calomel, followed by senna, &c. &c. forms no part of their practice, nor enters apparently into their minds as a desideratum. The theory of expectoration, indeed, which considers the febrile movements as essential to the return of health, forbids such an interference as disturbing the course of nature, and (by a strange prejudice) as originating those visceral congestions which we find to be averted by the practice in question.

The prevalence of this doctrine, conspiring with the currency of the Brunonian theory, leads also to a more sparing employment of the lancet than is usual with us. The temperance of the natives, the facility of perspiration which their climate produces, will doubtless enable them to throw off inflammation, with much less depletion than is necessary in treating the same cases in England. But from the frequency of consumption among the French, there seems to be great danger in their suffering even slight pleurisies and peripneumonies to run their natural career, when they can be cut short at once by a slight blood-letting: not to mention the protraction of the disease, and the fatigue of a long continued expectoration.

By the dread which prevails of powerful remedies, and by a strong remaining tincture of Galenical practice, there exists among the French physicians considerable confidence in drugs which English practice has consigned to oblivion, as insignificant and inert. Their patients are still drenched with pint draughts, "pour adoucir, lênifier, tempérer, et rafraichir le sang," and "pour amollir, humecter, et rafraichir les entrailles;" [to sweeten, lenify, temper, and refresh the blood, and to soften, moisten and refresh the bowels;] in the efficacy

of all which both physician and patient "most potently believe."

It is no very flattering result for the art, but it is most unquestionably true, that the proportion of deaths to recoveries in disease, is, with a very few exceptions, the same under every plan of treatment. The number of those who must inevitably die from the violence of the malady, and of those who, from the opposite cause, must necessarily recover, is so great, in comparison with that of the persons who owe their life or death to the skill or ignorance of the physician, that it is rarely possible to appreciate the merit of remedial treatment, by this test.

It was not, therefore, without much surprise, that the author of these pages found the average loss, in the Parisian hospitals, to be much greater than usually occurs in those of the British metropolis. In the report made to the French government on the charitable institutions of Paris, in the year 1808, it appears that there were received during the year 1806, into the hospital called "*La Charité*," the best, though not the most extensive in Paris, three thousand two hundred sick. Of these were

Discharged	2570
Died	386
Remained in the hospital . . .	244
	3200

The mortality, therefore, was as one to 6,67.

The *Hôtel Dieu*, on the first of January 1806, contained one thousand two hundred and seventy-four sick. The mortality on the whole number taken in during the year was, for the men, as one in 5,38, and for the women as one in 4,36.

But, in order to arrive at a greater degree of accuracy, the reporters take into consideration that many patients die on the first days of admission, whose decease is not chargeable against the practice of the hospital. On this account they state, that of one thousand and eighty-seven males deceased, five hundred and thirty-six died in the first ten days; and these being deducted, the mortality becomes reduced to one in seven; and

the same rule being applied to the deaths among the women, the average is rendered one in 5,46.

By the applications of this method to the deaths and recoveries at *La Charité*, the mortality of the men becomes one in 8,38, and that of the women one in 5,82, giving a total average of $\frac{8,38+5,82}{2}=7,10$.

The average duration of the cases, excluding those who died or left the hospital during the first ten days, was, at *L'Hôtel Dieu*, thirty-seven days; and at *La Charité* thirty days; the female cases being in both the most protracted.

The vast number of desperate accidents and of severe disease which such a city as Paris must produce, renders some deduction from the sum total of mortalities absolutely necessary for the justification of the medical practice; but in taking so long a time as ten days for the standard, in distinguishing curable from incurable maladies, there must necessarily be excluded the great majority of deaths by fever; and the physician must consequently be relieved from a greater *onus* than he is entitled to. The mortality which remains seems therefore enormous, and it greatly exceeds the average number of deaths in those even of our hospitals which are destined exclusively to the reception of fever cases. The average mortality in that fatal endemic, the Walcheren fever, where the patients had to struggle under every disadvantage of military vicissitudes and privations, did not much exceed one-tenth.

The great difference observable between the institutions of France and England, subsists also in their public charities. In England these are the fruits of individual benevolence, and are separately governed according to the will of their respective founders and contributors. In France they are under the management of the government, and are all regulated by a common police.

It is not easy to state with becoming accuracy, all the consequences resulting from each of these methods. It appears, however, that a more comprehensive view is taken of the wants of the French metropolis, and that considerable advan tage results in the arrangement and distribution of the sick. On the other hand, there is a manifest inconvenience, if not

danger, in bringing the sick from the remotest part of the city to a central bureau, for the purposes of preliminary inspection.

The largest hospital in Paris is the *Hôtel Dieu*, which was designed to contain two thousand beds for constant occupation, and two hundred kept as a reserve for accidents. It does not, however, contain at present so great a number. Its situation is by no means well chosen, being in the very centre of the city; but as it is placed on an island in the middle of the river, the current of air occasioned by the stream must be favourable to ventilation. The wards are spacious, and perfectly well aired; and the patients are attended by a society of nuns of the order of St. Augustin, with the utmost humanity, and with a zeal that passed the fiery ordeal of the revolution unabated and unsullied.

La Charité contains only two hundred and thirty beds, of which one hundred and twenty are set apart for medical cases, and one hundred and four for those requiring surgical treatment.

The hospital of *St. Antoine* contained on the first of January, 1806, one hundred and seventy-two, and it received during the year two thousand two hundred and sixteen. Total mortality one in 5,74, or, with the former abatement, one in 7,42.

L'Hôpital Beaujon contained on the 1st of January 1806, ninety-eight sick, and received during the year one thousand four hundred and forty-six.

Gross mortality one in 5,96.

L'Hôpital Necker contained, at the commencement of the year, one hundred and thirty sick: received during twelve months one thousand and thirty-nine. Mortality one in 5,59.

L'Hôpital Cochin has provision for one hundred sick. Mortality in 1806, one in 6,96.

L'Hôpital de St. Louis contains nine hundred beds, and was designed to receive infectious cutaneous diseases, also scrophula and scurvy.

L'Hôpital des Venériens has five hundred beds. It received, in 1806, two thousand six hundred and sixty sick, of whom one thousand three hundred and forty were men, and one thousand three hundred and twenty women; an equality of

numbers that appears worthy of remark, if moral causes be taken into consideration. The mean duration of the cases was sixty-two days, and the mortality as one in 22,54.

Before the revolution such cases were principally taken to the *Bicetre;* but the whole number received there amounted only to six hundred annually, while that of the applicants was more than two thousand; and these are said to have formed scarcely a fourth of the number requiring assistance: for the majority were withheld by their hopelessness of obtaining admission, and by the horrible condition of the sick when admitted. Each ward contained several ranges of beds; the floors were also strewed with them; yet notwithstanding that three or four sick were sometimes placed in each bed, they were obliged to rise in the middle of the night, to make room for others to take a turn of repose. If to these considerations it be added that the names of the applicants were often placed on the list for admission eighteen months before they could be received, some notion may be formed of the sort of disease, and of the treatment which that hospital exhibited.

L'Hôpital des Enfans Malades [The Hospital for sick children] contains five hundred beds. In 1806 two thousand one hundred and sixty-one sick were admitted. The mean duration of the cases was seventy days. The mortality of the boys was one in 3,81; that of the girls one in four. They were admitted from two years to fifteen.

The lunatic hospitals are, one at Charenton, in which forty beds for men and twenty for women are maintained, at the charge of the hospitals of Paris. The Bicêtre has accommodation for above one hundred persons: at la Salpêtriere there are from seven hundred and fifty to eight hundred females: some of these are incurables; others, deemed curable, are selected from such as have not obtained admission at Charenton. They are placed in five separate departments or wards: one an hospital for incidental disease, one for incurables, one for furious maniacs, a fourth for those not dangerous, and a fifth for convalescents. The two last contain a spacious walk shaded with trees. In the practice of this hospital, which is under the superintendance of Pinel, great stress is laid upon the tepid bath, as a remedy for mania; to which is added, when the patient is

riotous, a douche [a pumping of cold water] falling several feet on the head: this practice seems to operate, not less as a moral, than as a physical remedy. Various local means are also occasionally applied, such as cauteries, leeches, blisters; but in general little reliance is placed upon the exhibition of drugs, while much confidence is placed in moral means, especially in occupation. In the physician's private room there are accumulated numerous casts of the heads of lunatics, forming a most hideous and fearful portrait of humanity. The sum total of the information which they afforded, was decidedly unfavourable to the physiognomical doctrines of Gall. Such, at least, was the opinion of Mons. Pinel on the subject; to whose politeness and urbanity the philosophic traveller, who visits this hospital, will always find himself largely indebted. To those who are unacquainted with the writings of this eminent physician, it will be consoling to know, that the utmost humanity and skill prevail in the treatment of maniacs in France: chains and whips are absolutely forbidden; and the most furious maniacs are restrained by a well-applied waistcoat. Another point also, in which morality and good feeling are cultivated, is in the seclusion of these unhappy patients. In no hospital are they made a public exhibition, to gratify the curiosity or the malignity of idle holiday-makers. Besides these hospitals, there are very many others, of a miscellaneous description. The foundling hospital, hospitals for incurable diseases, for the blind, several military hospitals, and an excellent one attached to the ecole de médicine, [the medical school,] &c. &c.; and the bureau de bénéficence [the benevolent office] distributes advice and relief to poor room-keepers at home. The funds for this charity are drawn, by an happy association, from a tax on the places of public amusement.

Besides the hospitals in which persons are gratuitously received, the delicacy of moral tact among Frenchmen has given birth to establishments, termed " maisons de santé," [houses of health,] in which those, whose fortunes have not reduced them to the necessity of receiving charity, but who are yet unequal to the expense of home attendance, may procure an apartment, the services of a nurse, physician, surgeon, and apothecary, upon the extraordinarily moderate terms of three

francs per day, paid a fortnight in advance, or of two francs only, when the invalid chooses to sleep in a common dormitory. Besides the establishment in the Rue du Faubourg St. Martin, which belongs to the government of the bureau de bénéficence, there are others belonging to individuals, who apparently render these institutions a mean of introduction to general practice. It may very well be doubted whether establishments like these could be introduced into England, where provisions are so expensive, and where civility, and the numberless inexpressible attentions which the sick require, must be purchased of the nurse by clandestine gratuities, and where there subsists so large a portion of petty pride and ostentation, to prevent small tradesmen and room-keepers from accepting an advantage which would so publicly mark their circumstances in life. The spirit, however, in which the maisons de santé are conceived, might be adopted at home with the benefit to the national character, to counteract the depressing influence of that system, which has placed nearly a quarter of the male population upon the parish lists, and bowed down the "bold peasantry, their country's pride," to pauperism and servility.

In the general management of the French hospitals, all the advantages of order and arrangement are attained, which might be expected from the military precision that the revolution has introduced into every branch of the public service. By six o'clock in the morning, nurse, physicians, surgeons, and pupils are assembled; and before twelve every patient is visited; half a dozen or more great operations, perhaps, performed; clinical lectures given, and advice administered to a crowd of external patients. The advantages resulting from these early hours, are, first, that the diet for the day is directed according to the actual wants of the patients; while in hospitals where this regulation does not subsist, any changes which the physician may make in the food and drink of the sick, can only be put into execution on the following day, when their situation and necessities may become very different. There is, besides, a great increase of comfort to those, whose wounds, &c. require dressing, and who are thus at an earlier hour put at rest for the remainder of the day. But the principal benefit which ensues from this practice, is in the case of great operations.

Very often in the English hospitals, a patient knows that he is condemned to an amputation, &c. &c. for some days before it is to take place: by operating every day, this interval is, in France, not extended beyond four and twenty hours; and by the early attendance of the surgeons, the immediate expectation is much diminished. It is in human nature so contrived, that those events which are separated by the death of each day's life, do not impress the mind so strongly as those which are to be performed in the current day: the agony of expectation, therefore, in these cases, is the most distressing from the period of waking in the morning, until the hour at which the operation is to be performed. During this time, every moment is counted; and the arrival of the surgeon is alternately desired and deprecated, as patience or apprehension assume the control; and thus, much of that courage which should be reserved for the moment of suffering, is expended in horrible anticipations, and unavailing regret. There can be no hesitation as to the propriety of adopting, in our English hospitals, this merciful custom of early attendance.

In the conduct of their operations, and, indeed, in their general intercourse with the sick, the French medical men are tender and kind-hearted; and at once an honour to their profession and to human nature. Their address is soothing, consolatory, eminently calculated to win confidence, and to quiet alarm. In action, they are prompt, dexterous and alert. Every thing is previously calculated, and every step of the process clearly foreseen and arranged in the mind, before any part of it is commenced. No time is thus spent in previous handling of the part; no interval is allowed to elapse between the different stages of the operation. After a moment's self concentration, the surgeon approaches the patient with some cheering and encouraging observation: he takes the knife; the incisions are made; the saw is instantly handed; the assistant is ready with his ligatures; the arteries are tied; and the wound closed in the shortest possible interval. The utmost silence and decorum are observed by the pupils during the whole time; and thus, both the moral and physical suffering attendant upon these horrible necessities of humanity, are reduced nearly to an absolute minimum. In all these particulars, the constitu-

tional kindness of the French character, the activity of their sympathies, and the warmth of their feelings, display themselves to the greatest advantage. There is no cant of sentimentality, no insincerity of compliment; their virtues are exhibited in positive result; and let those who are virulent in their abuse of the national character, blush, when they talk of degraded morals and egotistical indifference.

Of the medical education in France, there has been already occasion to speak with praise: the subject is peculiarly interesting at the present moment, from the disputes to which it has given occasion in our country,

There are in France three Universities, having power to confer medical degrees; that of Paris, of Montpellier, and of Strasbourg; and the graduates of these places are at liberty to practise in Paris, or elsewhere in France, upon registering their names at the municipality of the arrondissement; a formality which is, however, often neglected, without drawing any serious consequences on the offender.

The different ranks acknowledged in practice, are those of doctor of medicine, doctor of surgery, and *officier de santè* (a rank answering somewhat to that of surgeon apothecary in London,) and lastly that of apothecary, whose functions are strictly confined to the compounding of drugs.

Before the establishment of this order, the practice of physic, like every other institution, had fallen into excessive abuses. The picture which the reporters of the new law have drawn, is sufficiently similar to that which might be sketched of the present state of practice in England, to warrant a short extract. They state that, " in spite of the apparent order which subsisted, time had introduced abuses and irregularities, against which all persons of intelligence had exclaimed for the last thirty years. Such particularly were the difference of qualifications for doctors, *intrà muros et extra muros;* the differences of privileges of bachelors, licentiates, regent, and non-regent doctors. Opposed to some advantages, were to be seen the passions and jealousies assuming the pretext of order, and the dignity of the profession, to torment those, who, either by novelty of doctrine or successful practice, had arisen to distinction and notoriety. Its two universities (those of Paris and

of Montpellier) preserved the severity and dignity of their examinations; all the others nearly had become culpably facile in their admissions, so that the title of doctor was conferred on absentees, and letters of reception were expedited by the post." To remedy these evils, the three universities were, by a law, equalized both as to privileges and to qualifications, and a degree from either is now alike available in all parts of the empire. There exist, therefore, in France, no corporate bodies, independent of the universities, to regulate locally or generally, the practice of physic; and infringements of the law are pursued, like any other penal offences, by the officers of the police. The time of study requisite for obtaining a doctor's degree in physic or surgery, is four years; the examinations to be passed, are one in anatomy and physiology, a second in pathology and nosology, a third in materia medica, chemistry and pharmacy, a fourth in *l'hygiène* and forensic medicine, and a fifth on internal or external clinical examination, according as the candidate determines for physic or surgery. These examinations are public, and two of them are directed to be held in Latin. After they have passed, the candidate has yet to write and to maintain others, either in French or Latin. The whole expense of study and for the degree is fixed at a maximum of one thousand francs, about forty pounds.

The qualifications for an *officier de santè* are six years' study under a doctor, or five years' attendance on the practice of a civil or military hospital; or lastly, three years passed in a school of medicine. He is examined by a jury composed of two physicians, domiciliated in the department, and a *commissaire*, who is taken from among the professors of the several schools of medicine: this jury assembles once a year. The examinations are three; one in anatomy, one on the elements of medicine, and the third in surgery and the most common parts of pharmacy. The whole expense is limited to two hundred francs. The duty of these persons is defined, by the reporters of the law, to be the general care of the sick, in remote country places, and the superintendence every where of such slight diseases as do not require the advice of the physician or surgeon.

Very particular pains seem to have been taken, respecting

the education of apothecaries. Courses of botany, natural history, chemistry, &c. are directed to be given in the schools of pharmacy; and no one is suffered to practise, without being first examined, either in the schools, or before a departmental jury. The examinations are, one on natural history, one on the theory of pharmacy, and another on its manipulations and processes. The last of these examinations must last for four days, and must consist of, at least, nine chemical or pharmaceutic operations, in which the candidate is to describe his materials, to explain his method of procedure, and declare the nature of their expected results. The candidate must be twenty-five years of age. The expense of his examination, in the schools, is fixed at nine hundred francs; or before the jury, at two hundred.

Officiers de santè, where there are no apothecaries, may supply their own patients with medicine, but they are not permitted to keep open shop. Apothecaries' shops are subject to visitation, by the professors of the schools of medicine, within a circuit of ten leagues from the place in which they are held. In all other places, this duty is performed by the jury of physicians.

The sale of quack medicines is utterly forbidden; and druggists are subject to a penalty of five hundred francs, if they presume to compound medicines. Both druggists and apothecaries are bound, under a heavy penalty, to keep a book, in which the names, residence, &c. are inserted, of all persons to whom they shall sell poisonous drugs; as also the nature of the drug, and the usage for which it is intended.

In the instruction of midwives, it is directed that an annual and gratuitous course of midwifery be given, in the largest hospital of the department. Before any person can be admitted to an examination, she must have attended two courses of lectures, have been present for nine months at deliveries, or have operated herself in the hospital, for six months. Women are not allowed to deliver with instruments, unless sanctioned by the presence of a physician or surgeon.

Such are the principal enactments of the law, which regulates the practice of physic. As far as could be gathered from general inquiries, it appears that the doctors in the two facul-

ties practise indifferently in each, without jealousy and without disagreement; and that even persons, having no legal title, practise in Paris, &c. without drawing upon themselves the infliction of the appointed penalty.

Apothecaries universally prescribe for the poor, and for such persons as ask their advice in their shops. The advertisements of quacks also figure upon the columns of the *Palais Royal*, no less than upon the walls of the Royal Exchange, in London. The new institutions of medical police in France are not therefore more effectual in regulating the practice of physic, than the obsolete enactments of the English law. It should seem that the most which can be effected by such legislative interference, is a general influence upon the profession; and that great forbearance and indulgence must ever be granted to individuals. For it is in the natural order of things, that society should break through the artificial distinction of ranks created in colleges and academies; and that having the purse in its own hands, it should distribute its favours wherever caprice or judgment directs. There ever must exist some few apothecaries, better skilled to practise physic than the ordinary mass of *routine* physicians; for genius is not confined to any rank: surgeons likewise will often be found, the bent of whose ability lies rather towards physic than surgery, and it is a manifest injury to society, and an injustice towards individuals, to deprive such persons of the exercise of their peculiar talent. It is besides a natural and an inevitable consequence, that mothers, indebted for their own and their children's lives, to the skill of an *accoucheur*, should extend their confidence in him through the other branches of the art, and call upon him to attend in the general diseases of the family; nor can any penal statute prevent her from preferring a tried friend, to making a confidence of the secrets of her family to a stranger. The poorer class of persons also will always apply for the cheapest advice, and will seek it among the compounders of medicine; notwithstanding any statute that may be made to the contrary. The apothecary will, indeed, be the small shopkeeper's physician, not more on the score of expense, than on account of the distance which education and habits of life place between such persons and the graduated doctors.

Two great difficulties oppose themselves to any regulation susceptible of a rigid practical adoption. Either other qualifications must be expected, than mere examinations, or that test must be taken alone. In the first case, individuals entitled by their knowledge to practise, will be excluded, when their fortunes have placed them out of the reach of university instructions; a decision with which the public will never comply. In the second, the entire object of legislative interference will be defeated, since no test is more undecisive or more capable of evasion, than the power of answering a few questions; a power which may be acquired by the short and summary method, well known to those whom it may concern, under the technical appellation of *grinding*. It should therefore become an established principle with all corporate bodies, to administer their powers according to the spirit of their institution, and not in the dead letter of monopoly; for, in proportion as their utility is circumscribed, individual oppression becomes offensive and intolerable.

From the whole that could be gathered from inquiries, not always very directly answered, the medical police, as far as it concerns the regulation of practice, seems to have become in Paris, a dead letter, without producing many cases of flagrant imposition, or exciting any jealousies or ill-will among the practitioners.

The school of physic in Paris is numerously attended. The faculty are in possession of a building of great convenience, and of beautiful architecture. But its amphitheatres, though of immense size, are not larger than is necessary for containing the crowded audiences, which consist not only of medical students, but persons attracted by the general love of knowledge. During the continuance of war, the demand for surgeons alone maintained a numerous class in the schools. Cuvier, in a desultory conversation with which he honoured the author of these sheets, stated the annual consumption of medical officers under Napoleon, at an average of five hundred.

The faculty of physic possess an extensive and valuable library, like all other Parisian libraries, of most easy access and much frequented. They have also a collection of preparations, inferior in many respects to those of the anatomy schools in

London; a collection of surgical instruments, and another of models. These last are beautifully executed, and represent recent dissections with a perfection, which no art can preserve in the parts themselves.

The faculty assemble at certain intervals, to read papers and to discuss practical points; for which purpose the members also bring patients for illustration and for example. At the sitting at which the author was present, a member exhibited some cases of very extensive suppurating tumours, which were absorbed and dissipated by the repeated application of the *moxa*. One of these tumours had occupied the whole of one side of the back, and must, from the appearance of the part, have contained nearly half a gallon of fluid. In the same sitting a paper was read recommending the exhibition of large doses of opium in cholera: the difference in the state of French physic and of surgery could scarcely be better illustrated.

Though abounding with scientific journals, France is not possessed of any periodical work on the healing arts, comparable with the Edinburgh Medical Journal, or the transactions of the London Medico-Chirurgical Society. The practice of giving detached observations to the public has not yet commenced in France, or is confined exclusively to the verbal communications made at the Institute, and other learned societies. Individual vanity has not taken this route to gratification, and authorship in general is not made a professional stepping stone, but is confined to a few individuals, who rarely deign to make their appearance in a less imposing manner, than by an entire system, or in a smaller shape, than a series of comely octavos. The practice also of the country *officiers de santè*, &c. is in all probability, too closely subjected to the law and the gospel of authority, to admit of those novelties, which pour in from all parts of the British dominions, upon the editors of periodical works; and which, if they subject the reader to the task of wading through much nonsense, still contain, among the chaff, a considerable portion of valuable grain, which, if not thus gleaned, would be lost to the service of humanity.

The " Bibliothéque Médicale" [the Medical Library,] consists entirely of extracts from published works and criticism.

The "Journal Général de Médicine," [the Journal General of Medicine,] commenced by Corvisart, Boyer, and Roux, has passed into other hands.

The "Journal Universel des Sciences Médicales" [the Journal Universal of the Medical Sciences,] is an entire new work, and has yet its reputation to establish.

"La Gazette de Santè" [the Gazette of Health,] is a single sheet, published every ten days, containing principally facts, with but a small portion of critical matter. It is valuable for its list of the cases, which are from time to time admitted into the hospitals of Paris; and it contains also a series of articles upon the history of medical opinions. This work is edited by Dr. Montégre, a gentleman of great talent, information, and zeal for science; and it is conducted in a spirit purely philosophical. Of these works, some have been recently silenced, by the operation of the new stamp duty, *usque adeo obtusa*, &c. Such is the spirit of the present government.

It has been the fate of physic, from the very first revival of letters, to creep slowly behind the other sciences, and to adopt their methods only at considerable intervals after their establishment and success. This has arisen partly perhaps from the culpable influence of authority, and partly also, from a laudable hesitation at innovating, where so great an interest is at stake. This remark will explain the present state of the science in France, which is still very greatly in arrear of its associate arts; and is commencing only that career, in which the other natural sciences have made such considerable progress. There is, however, good cause to believe, that the impetus which it has received, will lead to speedy and important improvements, and that the spirit of Bichat, Gaulois, and Majendie, will be carried to practical discussions. To the habit of observation, on which the French physicians so justly pride themselves, there will then be added a greater degree of enterprise in the employment of curative means, and thus they will become entitled to take a lead in forming the medical opinions of Europe; and will have weight enough to induce our own countrymen to set bounds to their empirical tendencies, if, as the French suppose, they are indeed verging to a vi-

cious excess, and tend to a partial degradation of the science itself.

At the time when the father of physic wrote, the observation of symptoms was the only road open to investigation. Chemistry, anatomy, physiology, did not exist, nor had natural philosophy explained any of the external causes which generate disease. But the leading reason which impelled Hippocrates into his peculiar line of inquiry, was the almost entire want of all really powerful remedies. Without bark, mercury, antimony, and opium, his means of operating upon disease were limited within very narrow bounds. His functions, as a physician, were reduced nearly to a vain and useless augury, while his views, as a philosopher, were necessarily directed to the subject itself, for the means of curing disease, by his ignorance of the resources of the external world. The present state of knowledge justifies and demands a different line of inquiry. It is no longer sufficient to know the disease; the physician must cure it. He must wield with courage and dexterity the weighty weapons, which modern discoveries have placed in his hands; and in this branch the French have yet much to learn. Their literature is eminently deficient in those monographic works, which in England have so powerfully contributed to the progress of medicine; and it is absolutely without names, to place in the same line of those of Hamilton, Currie, Saunders, Pemberton, Blackall and Watts. They have, however, but a small barrier to pass, a few prejudices to cast aside, and the zeal with which natural science is so universally pursued, will lead them rapidly forward in the right path. In the mean while it is to be hoped, that the horrible and barbarous system of insulation and seclusion, which for thirty years has cramped the energies and checked the progress of the sciences, will give place to a peaceful intercourse between nations: or, at least, that war will be conducted upon a more humanized plan. Whatever may be the political relations of independent states, it belongs to the illumination of the present age to determine, that the lettered and scientific world shall be considered as universally at peace; that it shall at all times be permitted by a freedom of intercourse and a liberal interchange of knowledge, to promote the great work

of human happiness; and, like pity, following in the train of slaughter, to heal up those wounds which the madness of ambition inflicts on the prosperity and civilization of the European republic.

Further improvement in Professor Leslie's method of producing Ice.

[From the Annals of Philosophy, for July 1817.]

TO DR. THOMSON.

DEAR SIR,

I think it worth while to mention in this stage of my experiments, that *parched oatmeal* has a stronger and more extensive power of absorbing humidity than even the decayed trap rock.

With about three quarters of a pound of meal, occupying a surface of seven inches in diameter, I froze nearly a quarter of a pound of water, and kept it for the space of twenty hours in the form of ice, till one half of the congealed mass was again melted.

The temperature of the room being nearly fifty degrees, the meal had then absorbed the eighteenth part of its weight, though it had not yet lost more than one third of its desiccating power.

With a body of dried oatmeal a foot in diameter and rather more than an inch deep, I have since frozen a pound and a quarter of water, contained in a hemispherical porous cup; and though the room is warmer than before, the energy of absorption seems to be capable of maintaining the state of congelation for a considerable time.

It is curious to observe, that when the experiment was reversed, and the surface of the water about double that of the meal, this substance acquired, after the air under the receiver had been rarified, a heat exceeding fifty degrees of Fahrenheit, so as to feel indeed sensibly hot on applying the hand.

I am, dear sir, sincerely yours,

JOHN LESLIE.

Surgical Institution at Baltimore.

The subscribers announce to the public that, authorised by the State Legislature, they have established, upon an extensive scale, a *Surgical Institution* for the reception of Patients requiring surgical aid, and that they are now ready to accommodate a considerable number.

The buildings appropriated to the purpose are spacious and commodious, a short distance from town, and situated in an elevated and remarkably healthy part of the country. Patients may be accommodated in the different buildings, according to their different situations in life, and with as much comfort and convenience as if lodged in their own house.

It is intended to receive in the Institution every description of Surgical disease, and to exclude all febrile and other diseases, capable of imparting contagion or infecting the atmosphere, as well as all maniacal and convulsive diseases. A particular part of the Institution will be allotted to the diseases of the eye and ear, and for the various operations which it is sometimes necessary to perform.

The subscribers have appointed, as superintendants of the institution, a Steward and Matron, who from their long experience in these departments, and accommodating dispositions, are eminently qualified to render the sick comfortable and to afford general satisfaction.

Two roads lead to the Institution, one by the Falls Turnpike, the other by Madison street extended—the particular spot is designated by finger posts.

Wm. Gibson, Surgeon.
Jno. Owen, Physician.

Obituary notice of Dr. Kuhn.

Died, on Saturday evening, July 5th, 1817, aged 76 years, Dr. Adam Kuhn, an eminent physician. Dr. Kuhn was a native of Lancaster in this state, and after passing through the first studies preparatory for his profession, he passed to Europe, and visited the most celebrated medical institutions. He spent several years as a student of the celebrated naturalist Linnæus at Upsal in Sweden, and having profited by the

knowledge of the ablest men of that period in Europe, nearly fifty years ago sat down in the capital of his native state, where he held a professor's chair in one branch or another for many years, and continued in the most successful practice of his profession; until within the three or four last years, he gradually retired from professional pursuits. As a husband, parent, and friend, his life was unostentatious and exemplary —as a physician, no man's reputation stood higher. His descendants having reached maturity, he had fulfilled his duties, and knowing them to be all happy, he parted with life without regret and without pain, calm and collected, and himself indicating the moment when he was to speak no more.

Death of Dr. Odier.

Dr. Odier, professor of medicine at Geneva and fellow of various learned societies, died at Geneva on April 14th, of an angina pectoris, at the age of 69. His long and very extensive practice, his various works, all of them highly esteemed, and his different courses of lectures, have established his reputation.

His death has occasioned the most lively regret.

The public loses in him, not only a skilful physician, but a zealous citizen, always ready to perform the painful and gratuitous functions to which he was called, and for which he was adapted by his talents, his knowledge, and his uncommon skill. His character and the sweetness of his temper rendered him dear to society. His family and friends are inconsolable for his loss.—*Annals of Philosophy, June* 1817.

The insertion of several original papers, has been unexpectedly omitted in the present number.

LIST OF RECENT EUROPEAN PUBLICATIONS.

Botany.

Flora Anomala; a general view of the Anomalies in the Vegetable Kingdom. By Thomas Hopkirk, younger, of Dalboth, with engravings.

Green's Botanical Dictionary, or Universal Herbal, Pt. IV.

Pomona Britannica. By George Brookshaw, Pt. X. royal 4to.

Medicine, Surgery, and Anatomy.

The Edinburgh Medical and Surgical Journal, No. 50.

The Annals of Medicine and Surgery, or Records of occurring Improvements and Discoveries in Medicine and Surgery; and the immediately connected Arts and Sciences, Part IV.

An Essay on Burns, in two parts; principally on those which happen to Workmen in Mines, &c. &c. By Edward Kentish, M. D. Physician to the Bristol Dispensary.

An Epitome of Juridical or Forensic Medicine. By George Edward Male, M. D.

Considerations on the Moral Management of Insane Persons. By J. Haslam, M. D.

A cursory Inquiry into some of the principal causes of Mortality among Children.

Suggestions for the prevention and mitigation of Epidemic and Pestilential Diseases. By Charles Maclean, M. D.

An Examination of the Objections made in Britain against the Doctrines of Gall and Spurzheim. By J. G. Spurzheim, M. D.

The Medical Guardian of Youth. By Robert John Thornton, M. D. &c.

Orfila's Toxicology, Vol. 2. Pt. 2.

Surgical Observations; being a Quarterly Report of Cases in Surgery, treated in the Middlesex Hospital, &c. &c. By C. Bell, Esq. Part III.

Natural History.

A new edition of Outlines of Mineralogy and Geology; to which is added an Outline of the Geology of England and

Wales, with a Map and Section of the Strata. By William Phillips.

An Introduction to Entomology, or Elements of the Natural History of Insects. By the Rev. William Kirby, B. A. F. L. S. and William Spence, Esq. F. L. S. vol. 2, with coloured engravings.

Scientific Books in hand, or in the press.

Dr. Scudamore is printing an enlarged edition of his Treatise on the nature of Gout and Rheumatism.

Mr. C. C. Bompas is about to publish an Essay on Light, Heat, and Electricity.

A translation of Orfila's Treatise on Chemistry is about to be published.

Dr. Marshall Hall will shortly publish the Principles of Diagnosis founded entirely on the external appearances of diseases.

A sketch of the history and cure of Febrile Diseases, particuarly those of the West-Indies, by Dr. Robert Jackson.

Annals of Philosophy, July 1817.

M. Carey & Son have in the press, and will speedily publish, an abridgment of Orfila's Toxicology, or general treatise on poisons, considered in their relations with physiology, pathology, and medical jurisprudence, by Jos. G. Nancrede, M. D., in one volume 8vo. This work, which was originally published in French, in two octavo volumes, has been reduced to what was deemed absolutely useful to the medical practitioner.

INDEX.

Page

ADAMS on the restoration of vision, &c. - - 348
Analysis of the mineral waters of Dunblane and Pitcaithly 64
Arts of India, remarks on the - - - - 156
Arabic cyphers, when first introduced into Europe - 160
Alkaline caustic used in tetanus - - - - 245
Analysis of the ergot of rye - - - - 429
of the sclerotium steriorum - - - 436
Antshar, or poison tree of Java - - - 451
Alkalies, caustic and carbonated, as poisons - - 507
Arsenic, rheumate of - - - - - 10
Arsenical poisons, Orfila on - - - - 492
Affection, fatal, of pudendum of female children - 11
Arteries and veins, on the diseases of - - - 77
Aneurisms, on the pathology and treatment of - *ib.*
Aneurism with singular appearance - - - 248
by anastomosis in the left orbit - - 478
Scarpa's improved operation for - - 436
Albers on the croup - - - - - 115
Albers, J. A. on the internal use of the nitrate of silver 206
Artery, carotid, tied to remove tumor - - - 462
to cure aneurism in the left orbit 478
Acetate of lead as a poison - - - - 511
Acid, rheumic, on - - - - - 1
how discriminated from citric acid - 6
from oxalic - 7
from tartaric - - *ib.*
from benzoic - *ib.*
Acid, sorbic, on the nature and combinations of - - 132
oxalic, as a poison - - - - 267, 506
prussic, as a poison - - - - 530
arsenious, as a poison - - - - 492
on a new, - - - - - - 447
Acids, concentrated as poisons - - - 504

Page

Antimony, rheumate of - - - - - 9
combined with mercury in cancer uteri - 188
Ancients, colours used by them in painting - - 130
Animal heat influenced by nervous system - - 193
Antimonial poisons, Orfila on - - - - 495
Antidotes to poisonous substances, table of - - 515
Animals, venomous - - - - - 544
Angina pectoris, memoir on - - - - 559
Ammonia, rheumate of - - - - - 8
recommended in the bite of serpents - 546
Arbor toxicaria of Rumphius - - - - 452
Aconitum napellus, as a poison - - - 521
Atropa belladonna, as a poison - - - - 535
Alcohol, as a poison - - - - - 541
Azotic gas, as a poison - - - - - 532
Amputation, remarks on - - - - 402
Albumen counteracts the effects of corrosive sublimate 491
Arum maculatum, as a poison - - - 524
Angustura pseudo-ferruginea, as a poison - - - 539

Baltimore, surgical institution at - - - - 594
Bark, Peruvian, recommended in ulceration of pudendum 17
Bath water, on the composition of - - - 69
Bayle's researches on pulmonary phthisis - - 98
Barrow's translation of Bayle on pulmonary phthisis - *ib.*
Barton, Dr. William P. C. appointed professor of botany - 123
Bladder and testicle, cases of diseased - - - 236
Baltimore, bill of mortality for 1816 - - - 286
Banks, falling of the Mississippi, described - - 302
Barytes, and carbonate and muriate of, as poisons - 508
Barton's vegetable materia medica of the United States 555
Blood-root or sanguinaria canadensis - - - 557
Benzoic acid discriminated from rheumic - - 7
Belgium, on the British hospitals in - - - 390
Belladonna as a poison - - - - 535
Bismuth, rheumate of - - - - - 10
nitrate of, as a poison - - - 503
Bill of mortality for Boston, for 1816 - - - 273
for New-York, for 1816 - - 274
for Harrisburgh, for 1816 - - 283
for Philadelphia, for 1816 - - 284
for Baltimore, for 1816 - - - 286

Page
Bill of mortality for Charleston, (S. C.) for 1816 - 287
British hospitals in Belgium, reports on - - - 390
Biography of Dr. Eusebio Valli - - - 413
Briggs, on Scarpa's improved operation for aneurism - 436
Brodie, B. C. on the varicose veins of the legs - 22
Botany, new publications on - - - 134, 596
Blow-pipe, Newman's experiments made with - 137
Murray's experiments with - - - 264
Professor Silliman on the - - - 289
Boston, bill of mortality for - - - - 273
Burrows, George Man, on the pathology of insanity - 51
Blue colour of the skin from internal use of nitrate of silver 206
Butini on the change of colour by the internal use of nitrate of silver - - - - - - 211
Butter's theory of angina pectoris - - - 561

Caldwell, Dr. C. appointed professor of natural history - 123
Clarke's experiments with Newman's blow-pipe - 137
Cataract, operation for, as performed in India - - 157
Cancer of the uterus, observations on - - - 179
cured by excision - - 182, 188
Chalk-stones, so termed, occurring in gout - - 218
Caustic, alkaline, its use in tetanus - - - 245
Charleston, (S. C.) statement of deaths and diseases for 287
Carbonate of barytes as a poison - - - 508
Cantharides as a poison - - - - - 510
Camphor as a poison - - - - - 540
Carpue on restoring a lost nose - - - - 550
Cancer and cancerous tendency, cases of - - 572
Calomel, opinion of French practitioners concerning - 576
Charite la at Paris, state of hospital - - - 579
Celsus, his treatment of varices of the legs - - 23
Chemistry, list of new publications on - - - 134
Celsus describes operation for cataract - - - 159
Citric acid discriminated from rheumic - - 6
Children, female, fatal affection of pudendum - - 11
Clift, W. his experiments on spinal marrow of fishes - 131
Cicuta virosa as a poison - - - - 538
Chimaphila umbellata - - - - 556
Copper, rheumate of - - - - - 10
Croup, Albers on the - - - - - 115

Page
Cooper, Dr. Thomas, appointed professor of mineralogy, &c. 123
Colours used in painting by the ancients - - - 130
Columbia, (S. C.) on the winter epidemic of - - 162
Colour of skin changed by internal use of nitrate of silver 206
Concretions, gouty, on the treatment of - - 235
Corn, musty, process for sweetening - - - 265
Consumption, pulmonary, on a species common in Great Britain - - - - - - - 326
Cornea, conical form of, destroying vision - - 348
College of physicians of Philadelphia, officers elected 424
Cooper, J. T. on some combinations of platinum - 441
Corrosive sublimate as a poison - - - - 488
how counteracted - 491
Copper as a poison - - - - - 497
Crowfoot, meadow, as a poison - - - 523
Colchicum autumnale as a poison - - - 524
Chlorine as a poison - - - - - 525
Conium maculatum as a poison - - - - 538
Cornus florida, its medical properties - - - 558
Cupreous poisons - - - - - 497
Cucumber, wild, as a poison - - - - 519
Cucumis colocynthis as a poison - - - - *ib.*
Cyphers or digits first introduced from Arabia - 160

Davy, Sir Humphrey, on the colours used by the ancients 130
Davis on the winter epidemic of Columbia, (S. C.) - 162
Daniell on a new species of resin from India - - 438
Dalrymple's case of aneurism - - - - 478
Datura stramonium as a poison - - - 536
Derby infirmary, how warmed and ventilated - - 45
Death of Dr. Odier - - - - 595
Deaths, report of, for Harrisburgh for 1816 - - 283
statement of, for City and Liberties of Philadelphia for 1816 - - - - - 284
statement of, for City and vicinity of Charleston,(S C.) 287
Devil's race-ground on the Mississippi described - - 304
Dewar on the preservation of lime water - - 459
Delphinium staphysagria as a poison - - - 522
Dispensaries, statements of the proceedings of the Philadelphia 122
Digitalis purpurea as a poison - - - - 537
Donovan M. on the nature and combinations of the sorbic acid 132

Page

Dog-wood, its medical properties - - - 558
Dunblane and Pitcaithly mineral waters analysed - 64
Dyspeptic phthisis, on the nature and treatment of 332, 339

Earle, Henry, on the use of nicotiana in retention of urine 35
on the influence of the nervous system - 193
Eau medicinale, its effects on the system - - 227
Evans, on the temperature of the summers in Philadelphia 425
Egg, white of, counteracts effects of corrosive sublimate 491
Emetic, tartar, as a poison - - - - 495
Earths, alkaline, as poisons - - - - 508
Experiments on the colours used by the ancients - - 130
on influence of spinal marrow, &c. - 131
Electricity, its effect on paralytic limbs - - - 194-5
Epidemic of the winter of 1815-16 of Columbia, (S. C.) 162
Excision of cancerous uterus - - - 182, 188
Excoriation and ulceration from pressure, how prevented 48
Ergot, a disease of the grain of rye - - - 266
on the analysis of - - - - 429
Euphorbia as a poison - - - - - 520

France, new pharmacopœia of - - - 128
state of medicine in - - - - 576
Falling banks of the Mississippi described - - 302
Faraday, on a new Acid Substance - - - 447
Faba sancti ignatii as a poison - - - - 538
Fever, puerperal, of Northumberland - - - 404
yellow, prevalent in some of the West India islands 125
yellow, on the temperature of summers favourable to 425
Fever-root, its medical properties - - - 558
French pharmacopœia, new - - - - 267
Fibres, muscular, on the laceration of - - 32
Fishes, experiments on the spinal marrow of - - 131
Frigorific mixture, new - - - - 266
Forest trees of Louisiana - - - - - 308
Foxglove, as a poison - - - - 537
Fungi, poisonous - - - - - - 540

Gastrocnemius externus, on the laceration of the fibres of 82
Galls, tincture of, best test of tartar emetic - - 495
Glass coarsely powdered, as a poison - - - 510

Page
Gamboge, as a poison - - - - - - 520
Gratiola officinalis, as a poison - - - - - 522
Gas, sulphurous acid, as a poison - - - - 525
nitrous acid as a poison - - - - - *ib.*
azotic, as a poison - - - - - 532
Gillenea trifoliata and stipulacea substitutes for ipecacuanha 559
Gout, Scudamore on the nature and cure of - - 213
treatment of - - - - - - 224
prophylactic regimen of - - - - - 230
chronic - - - - - - 232
retrocedent - - - - - - 235
Gouty inflammation distinguished from rheumatic - 224
Goodlad's case of tumor of face and neck - - - 462
Gold, salts of, as poisons - - - - - 503
Gun-shot wound, singular case of - - - 246

Hartshorne on the use of alkaline caustic in tetanus - 245
Hatchett's process for sweetening musty corn - - 265
Hare's blow-pipe - - - - - - - 289
Henderson, John, on rheumic acid - - - - 1
Heberden, W. on preventing excoriation and ulceration - 48
Hewson, Dr. Thomas T. appointed professor of comparative anatomy - - - - - - - 123
Heart, on the principle on which its action depends - 128
Heat, animal, influenced by the Nervous system - 193
Hening's singular case of gun-shot wound - - 246
Heustis on the topography of Louisiana - - 292
Helleborus niger as a poison - - - - - 517
Henbane as a poison - - - - - - 530
Hemlock, and water hemlock as poisons - - - 538
Heberden's sentiments on angina pectoris - - 561
Hodgson, Joseph on the diseases of arteries and veins, &c. 77
Hospitals, British in Belgium - - - - 390
state of in Paris - - - - 578
Pennsylvania, patients admitted into - - 423
Horsfield, on the oopas or poison tree of Java - 450
Hôtel Dieu, Paris, state of - - - - - 578
Humeri os, fracture of, treated by a seton - - 460
Hydrocele on the cure of, by injection - - - 239
Hyslop's case of incontinence of urine cured by pressure 476
Hyoscyamus niger, as a poison - - - 530

Page
Hydrogen sulphuretted, as a poison - - - 543
Hydrophobia or rabies - - - - 545, 546

Inflammation, fatal of female pudendum - - - 11
Insanity, on the pathology of - - - - 51
notice of Spurzheim's treatise on - - 269
Inflammation of uterus produces malignant ulcer - 191,192
Jackson's case of aneurism - - - - 248
account of puerperal fever of Northumberland 404
Java, on the oopas or poison tree of, - - - 450
Jatropha curcas as a poison - - - - 523
Ignatius's bean as a poison - - - - 539
Intelligence, medical and philosophical - 122,264,419,576
Injection recommended in the cure of Hydrocele - 239
Interments, annual report of for New-York - - 274
Insects poisonous - - - - - 544
Ice, improvement in professor Leslie's method of producing - - - - - - - 593
Infirmary of Derby, mode of ventilating and warming - 45
India, remarks on the arts of - - - - 156
on a new species of resin from - - - 438
Iron, rheumate of - - - - - - 9
Incontinence of urine cured by external pressure - 476
Iodine, its effects as a poison - - - - 514
Juniperus sabina, as a poison - - - - 520
Jurine on angina pectoris - - - - 559, 562

Klapp's cases of mania à temulentia - - - 251
Ker procures a new resin from India - - - 438
Kuhn, Dr. Adam, obituary notice of - - - 594

Laceration of muscular fibres - - - - 32
Lactuca virosa as a poison - - - - 532
Lead, rheumate of - - - - - 10
Legs, on the varicose veins of - - - - 22
Lens, crystalline, mode of removing, in India - 157
Lead, as a poison - - - - - - 511
Leslie, professor, improvements in his method of producing ice - - - - - - - 593
Ligature of arteries, effects produced by - - 204
Lime water, on the preservation of - - - 459

Page
Lime as a poison - - - - - 509
Lobstein's remarks on healing powers of phosphorus - 125
Louisiana, on the topography of - - - 292
London truss society, report of - - - - 419
Lytta vesicatoria as a poison - - - - 510

Marrow, spinal, of fishes, experiments on - - 131
Malic acid, Donovan's observations on - - 133
M'Dowell's cases of extirpation of diseased ovaria - 242
Mania â temulentia, method of treatment of - - 257
M'Culloch's new frigorific mixture - - - 266
Maunoir on the operation for artificial pupil - - 356
Materia Medica, vegetable, of the United States - - 555
Mercury, rheumate of - - - - - 10
Meteorological observations for 1816 - - - 124
for 1817 - - - 421
Medicine, surgery, &c. list of new publications on - 135
Mercury combined with antimonials, recommended in cancer uteri - - - - - - 188
Medical publications, list of recent - 125, 288, 596
Mercurial poison, Orfila on - - - - 488
Meadow crowfoot as a poison - - - - 523
saffron as a poison - - - - 524
Menispermum cocculus as a poison - - - 540
Medicine, state of, in France - - - - 576
Mineral waters of Dunblane and Pitcaithly analysed - 64
Mineralogy and geology, list of new publications on - 135
Mixture, new frigorific - - - - - 266
Missisippi, description and account of - - 299
Minutes of cases of cancer cured by pressure - - 572
Mortality, bill of, for the town of Boston - - 273
for New-York for 1816 - - 274
for Philadelphia for 1816 - - 284
for Harrisburg - - - - 283
for Baltimore - - - 286
for Charleston, (S. C.) - - - - 287
Momordica elaterium as a poison - - - 519
Morgan on the state of medicine in France - - 576
Muscles, on the laceration of the fibres of - - 32
Murray, J. on the mineral waters of Dunblane and Pitcaithly 64
experiments with the new blow-pipe - 264

Page
Musty corn, process for sweetening - - - - 265
Muriate of tin as a poison - - - - - 500
of gold as a poison - - - - - 503
of barytes as a poison - - - - 508

Natural history, new publications on - - - 134
Newman's blow-pipe, experiments made with - 137
Nervous system, influence of, in regulating animal heat - 193
New-York annual report of interments for 1816 - 274
New-Orleans, descriptive sketch of - - - - 306
Nicotiana, its use in retention of urine - - 35
Nitrate of silver internally used changes the colour of the skin - - - - - - 206
as a poison - - - - - 502
Nitrate of bismuth as a poison - - - - 503
potash as a poison - - - - 524
Nitrous acid gas as a poison - - - - 525
Northumberland Pennsylvania, puerperal fever of - 404
Nose, operation for restoring - - - - 550
Nux vomica, as a poison - - - - 538

Oxalic acid, discriminated from Rheumic - - - 7
as a poison - - - - 267
Ovaria, extirpation of diseased - - - - 242
Os humeri, fracture of treated by a seton - - 460
Obituary notice of Dr. Adam Kuhn - - - 594
Observations, meteorological, for 1816 - - 124
for 1817 - - - 421
Odier, death of Doctor - - - - 595
Operation, improved for aneurism - - - 437
for restoring a lost nose - - - 550
Oil, olive, to be injected in cases of spasm of urethra - 41
Officers of American philosophical society, for 1817 - 123
Osiander, professor, on excision of the uterus - - 182
Orfila, Traité des Poisons - - - - 485
Oxide, white of arsenic, as a poison - - - 492
Opium, as a narcotic poison - - - - 528
Oopas, or poison tree of Java - - - - 450
Oxymuriate of mercury, as a poison - - - 488
how counteracted - 491

Page
Pathology of insanity - - - - - 51
Patterson, Dr. Robert M. appointed professor of natural philosophy - - - - - - 123
Pharmacopœia, new, of France - - - 128, 267
Painting, on the colours used by the ancients - - 130
Planters in the Missisippi described - - - 302
Platinum, on some combinations of - - - 441
Parry's description of angina pectoris - - - 561
Plaster used in compression of cancer - - 574
Pennsylvania, university of, new appointments of professors 123
graduates in medicine for 1817 - 270
hospital, table of patients admitted - 423
Pressure, external, cures incontinence of urine - - 476
cures cancer or cancerous tendency 572
Pitcaithly and Dunblane mineral waters analysed - 64
Phthisis, pulmonary, Bayle's researches on - - 98
dyspeptic, of the nature of - - - 339
Philosophical society, American, officers of, for 1817 - 123
Philip A. P. Wilson, on the principle of the action of the heart 128
on a species of pulmonary consumption 326
Philosophical transactions, contents of, for 1816 - 268
Philadelphia, statement of deaths and diseases in, for 1816 284
college of physicians, officers for 1817 - 424
Pippsissewa, its medical properties - - - 556
Potash, rheumate of - - - - - 8
nitrate of as a poison - - - - 524
Professors of natural science in university of Pennsylvania 123
Phosphorus, on the healing powers of - - - 125
as a poison - - - - 509
Polypus, ulcerated, of the uterus confounded with cancer 187
Phosphoric acid, its quantity in urine, how determined - 222
Poisonous substances, table of with their antidotes - 515
Poison tree, or Oopas of Java - - - - 450
Poisons, treatise on, by Orfila - - - - 485
mercurial - - - - - 488
arsenical - - - - - 492
antimonial - - - - - 495
cupreous - - - - - 497
from tin - - - - - 500
from zinc - - - - - 501

Page
Poisons from silver - - - - - - 502
from salts of gold - - - - - 503
from salts of bismuth - - - - - *ib.*
from the concentrated acids - - - 504
from the caustic and carbonated alkalies - - 507
from alkaline earths - - - - - 508
from phosphorus - - - - - - 509
from lead - - - - - - 511
acrid, enumeration of - - - - 516
their general effects and treatment - 525
narcotic - - - - - - - 527
their general effects and treatment - 532
narcotico-acrid - - - - - 535
their effects and treatment - - - 542
septic or putrefying - - - - 543
Pudendum of female children, fatal affection of - - 11
Pulmonary phthisis, Bayle's researches on - - 98
Publications, new European quarterly list of - - 134
recent medical - - - - 288
botanical - - - - 596
on medicine, surgery and anatomy - *ib.*
Pulmonary consumption, on a species common in Great Britain - - - - - - - - 326
Pupil artificial, on the operation for - - - 354
Puerperal fever of Northumberland - - - 404
Prussic acid as a poison - - - - 530
Pustule malignant - - - - - 545
Puccoon, its medical properties - - - 547
Physicians, Philadelphia college of, officers elected for 1817 424

Ranunculus acris, as a poison - - - - 523
Rabies, spontaneous, - - - - 545,546
Reviews, of Murray's analysis of the mineral waters of Dunblane and Pitcaithly - - - - 64
Hodgson's treatise on the diseases of arteries and veins, &c. - - - 77
engravings to illustrate some of the diseases of arteries - - *ib.*
Bayle's researches on pulmonary phthisis - 98
Albers on the croup - - - - - 115
Scudamore on the nature and cure of the gout 213

Page

Reviews, of Wadd's cases of diseased bladder and testicle - 236
Carson on the causes of the motion of the blood 368
Parry on nature, &c. of the arterial pulse 368,382
Thomson on British hospitals in Belgium - 390
Orfila's treatise on poisons - - - 485
Carpue on restoring a lost nose - - 550
Barton's vegetable materia medica - - 555
Jurine on angina pectoris - - - 559
Young's cases of cancer - - - 572
Rheumic acid, on - - - - - - 1
Rheumate of potash - - - - - 8
of soda - - - - - *ib.*
of ammonia - - - - - *ib.*
of iron - - - - - 9
of zinc - - - - - - *ib.*
of tin - - - - - *ib.*
of antimony - - - - - *ib.*
of mercury, copper, bismuth, arsenic and lead 10
Retention of urine, use of nicotiana in - - - 35
Retroversion of unimpregnated uterus mistaken for cancer 186
Rheumatic inflammation distinguished from gouty - 224
Resin, on a new species, from India - - - 438
Richmond, on the winter epidemic of 1815 - - 176
Roget, P. M. on the internal use of nitrate of silver - 209
Ruptures, society for relief of poor suffering from - 419
table of cases of - - - - 420
Rhus radicans and toxicodendron as poisons - - 521
Rye, ergot of, analysis of - - - - 429

Sawyers of the Missisippi described - - - 32
Scarpa, on the operation for artificial pupil - - 363
Scarpa's improved operation for aneurism - - 436,7
Stansfield's case of ununited fracture cured by seton - 460
Stavesacre, as a poison - - - - 522
Saffron, meadow, as a poison - - - - 524
Stramonium, as a poison - - - - 536
Sanguinaria canadensis, its medical properties - - 557
Scleroma of the uterus distinguished from cancer - 185
Sneezing, severe, a premonitory symptom of the gout - 216
Sclerotium steriorum, on the analysis of - - 436
Seton, successful application of, to a fracture of os humeri 460
Serpents, treatment of the bite of - - - 546

Page
Scirrhus of the uterus cured by excision - - 179, 185
distinguished from other diseases - *ib.*
Skin, its colour changed by internal use of nitrate of silver 206
Silver, nitrate of, as a poison - - - - 502
its effects on the skin when internally used 206
Silliman, professor, on the blow-pipe - - - 289
Scilla maritima or squills, as a poison - - - 528
Soda, rheumate of - - - - - 8
Society, American philosophical, officers of, for 1817 - 123
royal, of London, contents of transactions for 1816 268
London truss, report of - - - 419
Sorbus aucuparia, on the acid obtained from - - 132
Scott's remarks on the arts of India - - - 156
Solanum nigrum, as a poison - - - - 532
Scorpion, treatment for the bite of - - - 546
Scudamore, C. on the nature and cure of the gout - 213
Spurzheim on insanity, notice of - - - 269
Summers, on the temperature of, in Philadelphia - 425
Sublimate, corrosive, as a poison - - - 488
how counteracted - - - 491
Sulphurous acid gas as a poison - - - 525
Surgical institution at Baltimore - - - - 594
Strychnos, the genus, as poisons - - - 538

Tartaric acid discriminated from rheumic - - - 7
Tracheitide, infantum de, auctore J. A. Albers - - 115
Transactions, philosophical of London for 1816 - 268
Tartar emetic as a poison - - - - - 495
Tartrate of potash and antimony as a poison - - *ib.*
Tetanus, case of treated with venesection and tobacco glysters - - - - - - - 42
Tetanus, on the use of alkaline caustic in - - 245
Thomas on the use of caustic alkali in tetanus - - 245
Topography of Louisiana - - - - 292
Thomson on British hospitals in Belgium - - 390
Trent J. on the winter epidemic of Richmond - - 176
Testicle and bladder, cases of diseased - - - 236
Tree, poison of Java - - - - - 450
Tshettik, or poison shrub of Java - - - 452
Tin, rheumate of - - - - - 9
Tin, muriate of as a poison - - - - 500
Triosteum perfoliatum, its medical properties - - 558
Tobacco, infusion of used as an enema in retention of urine 38

Page
Toxicologie générale, or treatise on poisons by Orfila - 485
Tobacco, as a poison - - - - - 536
Truss society of London, report of - - - 419
Tumour of face and Neck removed by tying carotid artery 462

Ulcer, malignant of uterus produced by inflammation - 191,2
Ulceration and excoriation from pressure, how prevented 48
fatal of pudendum of female children - 11
University of Pennsylvania, graduates in medicine - 270
Upas tieuté as a poison - - - - - 538
Upas-antiar as a poison - - - - 539
Urine, use of nicotiana in retention of - - - 35
incontinence of, cured by external pressure - 476
how to determine the quantity of phosphoric acid in 222

Varicose veins of the leg, on treatment of - - 22
Vaccination, ordinance of the city councils respecting - 122
Valli, biographical sketch of Doctor - - - 413
Vauquelin's analysis of the ergot of rye - - - 429
Vapour of arsenic, poisonous - - - - 495
Veins, varicose, on the treatment of - - - 22
Ventilating and warming Derby infirmary - - 45
Veins, on the diseases of - - - - - 77
Verdegris, as a poison - - - - - 498
Veratrum album as a poison - - - - 517
Vegetable Materia Medica of the United States - 555
Virey on the ergot of rye - - - - - 266
Vision, on the restoration of - - - - 348

Wardrop, James, on the laceration of the fibres of muscles 32
Warming and ventilating Derby infirmary - - 45
Waters, mineral, of Dunblane and Pitcaithly - - 64
Wadd's cases of diseased bladder and testicle - - 236
Wichman's description of angina pectoris - - 563
Wood, Kinder, on fatal affection of pudendum - - 11
Wound, gun-shot, singular case of - - - 246
Wounds, on the different kind of, in battle - - - 392
Woollens, Dr. Joseph, obituary notice of - - 424
Wolf's bane, as a poison - - - - - 521

Young's minutes of cases of cancer - - - 572

Zinc, rheumate of - - - - - 9
sulphate of, as a poison - - - - 501